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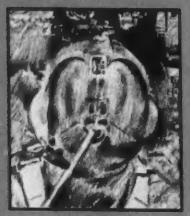

page 5

page 12

1 **Aviation In The French Army,** BG Maurice Cannet
5 **III Corps Aviation,** CPT Robert V. Lambert
7 **2d Armored Division,** MAJ Odis J. Lambright
8 **1st Cavalry Division Aviation,** 1LT Anthony W. Warren
10 **AVRADCOM's Aviation Life Support Developments,** Robert A. Matthews
12 **6th Cavalry Brigade Plays Its Ace,** MAJ Stephen J. Snow
16 **PEARL's**
19 **Cobra Weapons Repair**
20 **DES Report To The Field: Is It Standardization Or Is It Technique?**
22 **Check Plane,** Al Hinton
24 **Recognition Quiz**
26 **THREAT: Volatile: Small Arms And Helicopters Do Not Mix,** CPT E. Gary Campbell
31 **OPMS Corner: Aviation Personnel Update,** MAJ Jeremiah O'Fihelly
32 **Europe's Helicopter Assembly Point,** SP4 Patricia Butler
34 **One Flight,** CW3 Michael F. Porter
36 **Reporting Final**
38 **Wood Chopping Snake,** James E. Boen
40 **Views From Readers**
41 **Aviator Stress,** CW3 William D. Watson
44 **The Bucking Bronco Syndrome,** Ronald R. Simmons
48 **ATC Action Line: Specialist Or Professional?**

Inside Back Cover: **ATC Awards**

page 26

page 41

page 44

Cover: **French Army's SA 342 Gazelle antitank helicopter fires a HOT (high-subsonic-optically teleguided) missile. Story "Aviation In The French Army" begins on page 1**

Richard K. Tierney
Editor

The mission of the ***U.S. Army Aviation Digest (USPS 415-350)*** is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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AVIATION IN THE FRENCH ARMY

Brigadier General Maurice Cannet
Commander of ALAT

ALAT Background And Present Organization. As early as 1939 the French Army started procuring such equipment as autoballoons and autogyros. The former were rapidly scrapped as being inefficient and the latter had not yet become operational by the time World War II broke out.

Actually, it was in 1943 that Aviation became a reality for our Army, with the operation of observation aircraft (provided by America) within our African Army. Since then ALAT (Aviation Legere de l'Armee de Terre) has undergone three different organizational structures.

- The first was our light aircraft and helicopter groups, which had the task of supplying all Army units with direct support in the main form of observation, liaison missions, and during the Algerian campaign tactical transport of Infantry units.
- The second was born at the close of our Algerian War in 1961, when the possibilities of the helicopter were fully recognized for combat missions. This resulted in the establishment of our larger units which consisted of some 40 helicopters at Corps and Division. These groups (GALCA and GALDIV) were made up of light helicopters employed for liaison and observation, to which we later added antitank and tactical transport helicopters.
- Our present organization dates back to 1977. It was effected at the same time as the Army was reorganized.

Accordingly, helicopters were separated into two types of units:

- *GHL (Groupe d'Helicopteres Legers),* with light helicopters exclusively for executing liaison missions and individual aid missions for dispersed users.
- *RHC (Regiment d'Helicopteres de Combat),* which was made up of a larger number of helicopters (72) designed for obtaining meaningful results for a given tactical situation. This is achieved by combining intelligence gathering, firing and movement obtained by various types of helicopters operating in coordinated action within the same organization (Regiment).

ALAT Helicopters And Missions. Today, ALAT employs three types of helicopters: *light, antitank* and *maneuver.*

The Alouette II and Gazelle SA 341 come under the light category. These are used by GHL for liaison, observation and small supplies transport. They are also employed within the RHC units as scout helicopters. For the latter mission they are equipped with a stabilized sight.

Antitank helicopters exist only within the RHC units. They are of the Alouette III type, equipped with the SS-11 wire-guided missile. This year we will start employing the SA 342 M, which is a second generation helicopter. It carries a HOT missile and various other special equipment.

Our Tactical transport helicopters are the SA 330 Pumas. In service within our RHC units they carry out two types of missions. Their foremost purpose is to give airmobility to infantry; the second is to provide the Army with urgent logistical support.

Combat helicopters as Fully Integrated Weapons Systems. ALAT has *several* frontline or combat helicopters which are submitted to a considerable risk of being destroyed by enemy fire. These helicopters, whether of the scout or armed types, must embody very special features to cope with enemy detection and fire, and be so conceived internally that they can easily adapt to the constantly more sophisticated equipment that they will have to carry as technology progresses.

We are now in a given phase of the evolution of this

Light Helicopters: SA 341 Gazelle (above), SA 342 Gazelle (left) and Alouette II (right)

type of helicopter. We note that other countries already have begun flying helicopters having airframes especially designed for combat. The designers have tried to offer the greatest possible versatility. A typical example is the Soviet Mi-24 HIND.

No doubt the coming years will witness the arrival of helicopters of a new kind, carrying the most varied equipment and weaponry—and all designed for survival in a hostile environment. We will certainly see many types appear, just as we saw many types of military aircraft appear between the two World Wars.

Discussions will be centered around the helicopters suitable for executing several different missions and those that have been tailored to one specific task. In the 1936 to 1939 period there was a famous quarrel which opposed the "multiseat twin engine fighter" suitable for bombing, fighter and reconnaissance missions *against* the specialized single engine aircraft. In the field of military helicopters the same concepts are still in opposition.

There is a need to design complete weapons systems. The first helicopters called upon to intervene during combat were utility aircraft combined with a weapon. This was the case for the "gun helicopter," whether the "Pirate" used during the Algerian War or the "gunship" type used in Vietnam. This also was the case of the Alouette III/SS-11.

The following generation, which included the AH-1 Cobra/TOW or the SA 342/HOT already represented the beginning of integration. The weapon system is mounted in a more logical manner: right from the construction stage, airframes are adapted to carry weapons; instrument panels are designed to accommodate weapons systems; and engines are delivered with reduced thermal signatures.

These initial steps in the right direction are not enough. To exploit these helicopters to the fullest and at the lowest cost, far more will have to be done—notably designing the entire system including platform, equipment and weapons as an integral system from the outset. Our manufacturers will have to give priority attention to system conception and there will have to be close harmony between the engineering departments in charge of designing airframes, engines, equipment and weapons.

Does this mean, as is often said, that each subsystem will be designed solely with a military purpose in view, and that future combat helicopters will have nothing to do with civil ones? I do not believe so, at least not for 20 or 40 years to come.

The performance that we demand of the helicopter itself is not really so different from that required by civil operators. Only the organization of its equipment and airframe geometry differ. We require the same reliability, easy maintenance and output of the engines and dynamic units.

Consequently, in the near future we except to see two helicopter categories proposed for the needs of the armed forces:

- Helicopters that are very close to civil helicop-

Antitank Helicopters: Three views of the Alouette III

ters, for missions behind the lines, especially liaison and transport.

- Helicopters with specially designed airframes but nevertheless having the same components as earlier machines. Engines, dynamic units and a considerable portion of the equipment will follow normal development lines as the differences in performance are still too insignificant to warrant huge investments for totally new and separate development and production work.

ALAT's Future In Modern Conflicts. Airmobility units either exist or are being incorporated into nearly all ground force systems.

As is usually the case when new weapons appear, two tendencies have been coexisting for many years. Under the first, the tactical role of the helicopter would remain limited to aiding other combat branches. Under the second, the helicopter would open the way to a totally airmobile battle corps. No doubt, the truth lies somewhere between these two extremes.

During the coming 20 years, the superior mobility given by the helicopters will provide a weighty advantage to Army forces who have them, but they will remain only one among many combat components, like tanks, artillery or the Engineer Corps. In some specific situations, when action is limited in time and space, helicopters could perhaps win the day by themselves. In others they would only be one minor link in the action of various armed forces. Most often, however, the best results will be obtained when employed in combination with the entire arsenal of the combat arms.

For the requirements of our Army, ALAT is now reaching a dimension that corresponds both with an overall tactical concept and with our financial resources. Development will now stabilize from the quantity point of view. From the quality standpoint, however, we must prepare for significant changes because these machines will have to cope with an adversary that is quite different from the one encountered during the preceding years.

Armored and mechanized divisions now are equipped with detection, support and firing systems which will endanger the relative impunity that the helicopter in tactical flight (NOE) has enjoyed until now.

First, armored divisions will be escorted by helicopters carrying automatic guns with sophisticated fire control equipment. These aircraft will cover and protect the tanks, thereby enhancing their action, preventing any airmobility attacks in the form of harassment or attrition maneuvers.

At the same time thermal imagery and high frequency radars will be used to detect helicopters more accurately and at greater distance than can be done with present optical devices. New infrared missiles will be a serious threat to any helicopter whose infrared signature will not have been decreased below the lower limit of sensitivity of these missiles.

Ground combat forces have already entered an evolutionary phase. It will not immediately make present

Maneuver Helicopters: The utility tactical transport PUMA with retractable landing gear down

helicopters obsolete. Our second generation antitank system, the SA 342/HOT with its small size, excellent NOE characteristics, and the performance of its weapon system will remain highly effective against tank units for another 15 years or so; for as long as it is not confronted by helicopters armed with guns.

Our own gun helicopter, the Puma which carries a 20 millimeter gun, is no longer adapted to present combat conditions and must soon be phased out in favor of second generation systems.

ALAT must start thinking about such future helicopters. This would remain little more than a dream if we did not take two imperatives into account from the outset:

- Financial constraints, not only with regard to the purchasing price of new aircraft, but with regard to life cycle costs.
- Human factors, in that the Army cannot employ personnel having the same high qualifications as the captains of intercontinental transports or cosmonauts.

There can be no question of abolishing what already exists and building a kind of abstract ALAT for the year 2000. Its heritage in the form of equipment and personnel must be gradually modified starting with what is most urgent.

ALAT is now analyzing what the best possible policy for the future will be. A compromise between tactical needs, financial resources and technical outlooks should make it possible to devise a general plan orienting the work of our industry.

The few indications that I can give at this time are extremely general:

- We have no urgent problem with regard to light helicopters. The Gazelle will gradually replace the Alouette II.
- The question of combat helicopters concerns all branches of the armed forces, and hence, our own. Our late start compared to the United States and the USSR should make it possible for us to avoid the pitfalls that trailblazers fall into. For our new helicopters we will have to conceive an organization of their equipment that will enable them to fly their missions under the environmental conditions already described but at a cost that could be coped with by the budget of the Army. Optronics open fascinating new roads, if we succeed in specifying the tactical objective that we might reasonably hope to achieve. We will be analyzing this subject jointly with the German Armed Forces and there are many complex options open. The guideline for any meaningful choice would always have to be a perfectly clear and coherent conception of military application. We in ALAT are convinced that solutions will be found that are tactically efficient and financially realistic, and that is the purpose of present studies.

General Cannet

CHARLIE ALFA, THIS IS DELTA MIKE 76. SIX TANKS IN OPEN FROM CHECKPOINT 31, 030 DEGREES, 700 METERS. OVER.
DELTA MIKE 76, THIS IS CHARLIE ALFA 61. ROGER, WE'VE GOT IT.
THIS IS DELTA MIKE 76. ROGER. BREAKING WEST.

III CORPS AVIATION

Captain Robert V. Lambert
III Corps G3
Aviation Division Staff

AN AIR CAVALRY team is screening the left flank of a coordinated combined arms attack on an enemy formation. The air cavalry team leader, from the 4/9th Cavalry Squadron (Air), has just completed an attack mission handoff to a battle captain of an attack helicopter team of the 7/17th Cavalry Squadron (AH) and shifted west to continue the reconnaissance.

Both units are nap-of-the-earth to avoid ADA detection from enemy positions identified by the 15th Military Intelligence Battalion's OV-1 Mohawk fixed wing aircraft equipped with side looking airborne radar. No longer a matter of just width and depth, all aircrews cautiously observe for enemy fighters and armed helicopters in this three-dimensional battlefield. Movements and engagements are keyed to the tank and mechanized infantry task force, advancing forward on the right flank, to use the suppression fires of the attack.

Behind the reconnaissance and attack teams, OH-58 Kiowa helicopters are maneuvering below the treetops. And, the forward air controllers and fire support teams are directing exact and deadly fires from the supporting artillery and the tank killing U.S. Air Force A-10 airplanes.

Glossary—page 6

The battle is not limited to the front lines. Aviation units of the 1st Cavalry Division and the 2d Armored Division attack and secure bypassed strongholds with air assault infantry and attack helicopter teams.

Medical evacuation aircraft from the 3d Platoon, 507th Medical Company (AA) pick up wounded throughout the sector. CH-47 Chinooks of Company D, 34th Support Battalion bring in a continuous supply of ammunition and fuel to FARPs and to supply bases supporting units on this rapidly shifting battleground.

The 16th Air Traffic Control Battalion, with its FOC and FCCs, continuously coordinates, directs and monitors the crowded airspace, while the 57th Signal Battalion aerial relays provide a vital C^3 I link to the front. Maintenance teams scattered throughout the sector work around the clock to repair and service airframes to fight the next battle.

* * *

The scenario above presents a complex, high intensity battle *with Army Aviation as an integral part of the combined arms team.*

Combat units at III Corps and Ft. Hood, TX have the unique opportunity, unequaled anywhere, to train for such combined arms operations. Operating at Ft. Hood are:

- Two maneuver divisions with their organic aviation assets.
- The 6th Cavalry Brigade (Air Combat), the first unit of its kind in the free world (see January 1980 ***Aviation Digest***).
- Corps support aviation including military intelligence/counterintelligence, medical evacuation, signal and supporting units for ATC and aircraft maintenance.

There are 206 square miles of maneuver area on the military reservation and more than 400 aircraft in 20 company/section-size units with a dozen different missions. It can be easily seen that aviation is active at Ft. Hood. More than 700 aviators assigned logged in excess of 57,000 flight hours in combined arms and individual ATM training in FY 1979. This total does not include some 9,800 hours logged on the local SFTS.

Aviation activities at Ft. Hood are continuously evolving to meet the demands of the modern battlefield, wherever it may be. Coordination, plans and procedures are reviewed, updated and streamlined to match technological and doctrinal developments. Some of the goals at III Corps and Ft. Hood are:

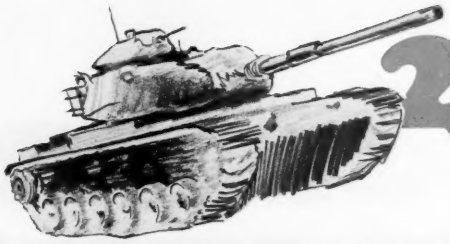
- Complete reorganization to full-strength aviation assets in accordance with ARCSA III concepts.
- Direct interface and training with National Guard/United States Army Reserve aviation units.
- Application of new aircraft with their advanced capabilities (such as improved AH-1S, AH-64, UH-60, CH-47D and OH-58C with followon ASH).
- Closer integration and interoperability with NATO and Allied operations and tactical deployment.
- Development of 24-hour, minimum weather operations.
- Application of doctrine developed in exercises and tests such as TASVAL and JAAT.
- Development of a corps level airspace and air defense management system to maximize both the battle force and self-defense.

The aviation and aviation support community at III Corps and Ft. Hood are highly diversified and experienced. Through intensified, multilevel combined arms training they are demonstrating an undeniable place on the current and future battlefield. The following articles, plus those that will appear in September and October, clearly show this.

Glossary

ARCSA III	Aviation Requirements for the Combat Structure of the Army	DRS	Division Restructure Study	NATO	North Atlantic Treaty Organization
ADA	air defense artillery	EW	electronic warfare	Reforger	Redeployment of Forces to Germany
ASH	advanced scout helicopter	FARP	forward arming and refueling point	SFTS	synthetic flight training system
ATC	air traffic control	FCC	flight coordination center	TACFIRE	tactical fire direction system
ATM	aircrew training manual	FOC	flight operations center	TASVAL	tactical aircraft effectiveness and survivability in close air support antiarmor operations
C^3I	(CCC) command, control, communications and intelligence	FORSCOM	U.S. Army Forces Command	TRICAP	triple capability
CONUS	continental United States	FY	fiscal year	VHF	very high frequency
		JAAT	joint air attack team		
		MASSTER	Modern Army Selected System Test, Evaluation and Review		

Major Odis J. Lambright
Assistant Aviation Officer
2d Armored Division



2D ARMORED DIVISION

MODERN COMBAT mobility, coupled with more accurate and lethal weapons than yesterday's, has greatly enhanced the capabilities of ground maneuver element commanders at all levels. This is certainly true of an armored division with its fast moving tanks, mechanized infantry and self-propelled artillery. At the same time the opposing forces also enjoy rapid mobility and can therefore restrict freedom of movement on the battlefield. Army Aviation can help alleviate that restriction by letting the ground commander know what lies ahead.

Army Aviation is an important part of 2d Armored Division operations, with the aviation assets being distributed among four units.

Company A, formerly the 2d Aviation Company, is the division aviation company and was activated last October as the first unit of the division's 502d Aviation Battalion. That battalion will continue to be developed under the ARCSA III (see page 3, August 1978 ***Aviation Digest***) concept during FY 1981.

Using OH-58 Kiowas and UH-1H Hueys, Company A aviators have flown more than 26,000 accident-free hours over the past 8 years, including an incident-free record last year. They have received the FORSCOM Commander's Plaque for Aviation Safety for the past 2 years.

Missions for the unit include providing helicopter support for the commanding general and other commanders, division field exercises, the Air Force forward air controller training program, medical evacuation, troop lifts and resupply; and furnishing a command and control platform, aerial observer capability, radio relay and courier service for artillery elements.

As an air cavalry unit, Troop D, 2d Squadron, 1st Cavalry, serves as the division commander's eyes and ears as it extends the reconnaissance and security capabilities of the ground units through its aerial assets. Those include the OH-58 Kiowa scouts which act as team leaders in JAAT missions, AH-1G Cobra aircraft that provide immediate suppressive fire for the aeroscouts, and UH-1H helicopters which give a ground reconnaissance capability and a quick reaction force for special missions.

A unique aviation unit of the 2d Armored Division is the "Quick Fix" platoon assigned to Headquarters and Operations Company, 522d Military Intelligence Battalion. This is the only unit of its kind in the continental U.S. Army. Its EH-1H and JU-1H aircraft provide an electronic warfare capability since they are designed to be targeted against enemy tactical VHF voice communications. The system can effectively hinder threat voice communications normally found at division level and below. One of the most advantageous uses of the Quick Fix aircraft is their employment when the division's ground-based collection or jamming assets are on the move or situated in a locale that renders them ineffective. Quick Fix can be used independently or in conjunction with other available EW units.

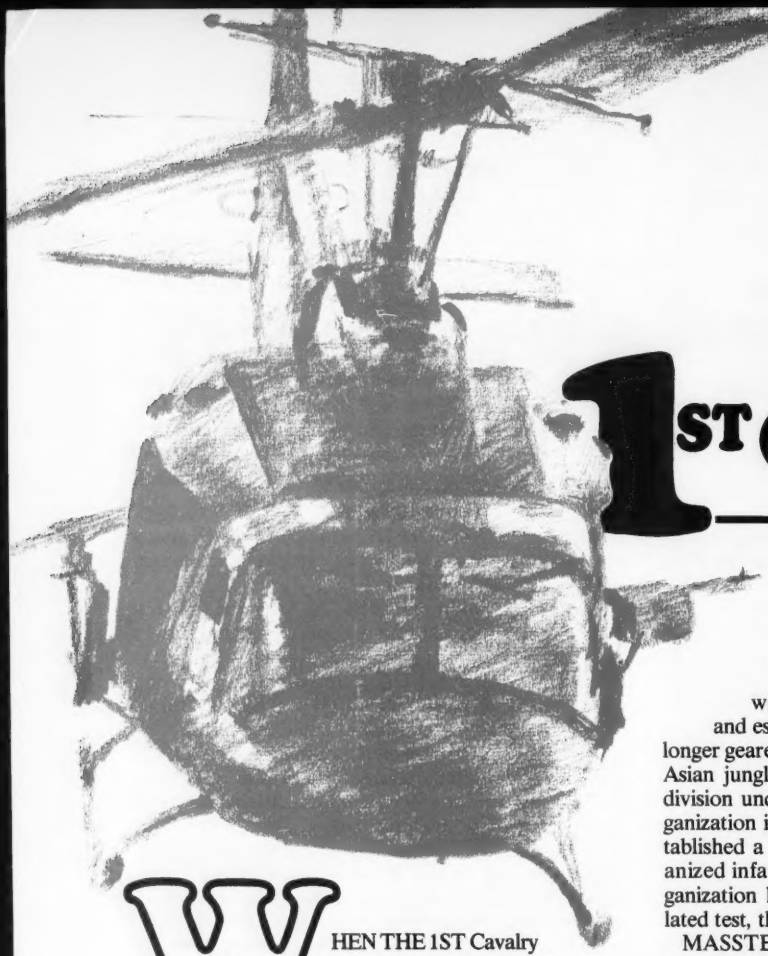
Because of the platoon's unique nature it has supported major field exercises at Ft. Lewis, WA; Ft. Carson, CO; Ft. Bragg, NC; Ft. Drum, NY; and Ft. Irwin, CA, as well as 3 years of the overseas Reforger exercises.

Company F, 124th Maintenance Battalion, handles the division's aviation intermediate maintenance support. It assists the aviation units in maintaining their aircraft in the highest state of operational readiness.

Plans are for this company to be reassigned to the developing 502d Aviation Battalion. Other units to be in the battalion are a headquarters company, two attack helicopter companies with AH-1S Cobras and a combat support helicopter company with UH-60 Black Hawks.

Army Aviation is a valuable asset to the combined arms team and has added new dimensions to the battlefield mobility of the 2d Armored Division. With the complete activation of an aviation battalion, the role of aviation in "Hell on Wheels" is certain to become even more important in the future.

Glossary—page 6



1ST CAVALRY

WHEN THE 1ST Cavalry Division dismounted from horseback to enter World War II, it no longer performed a unique mission by virtue of its specialized equipment. But when the division deployed to the Republic of Vietnam in 1965, with its latest specialized equipment—the helicopter, it again assumed a unique role. As one of the most decorated and praised units in the Southeast Asian conflict, the 1st Cavalry Division (Airmobile) "Skytroopers" brought the helicopter to a new position as a combat vehicle and weapon.

Since the end of the Vietnam conflict change has been a way of life for the 1st Cavalry Division, and many of those changes have affected the FIRST TEAM's aviation program. The division has unofficially become the Army's "testbed" for new equipment and ideas, and it is this testing role that has implemented many changes within the division and, in instances, within its aviation units. The helicopter and the airmobile infantry are no longer trademarks of the FIRST TEAM; tanks and armored personnel carriers are now the teeth of the division's combat power.

Change for the FIRST TEAM began when the division returned from Vietnam and established a new home at Ft. Hood, TX. No longer geared toward a mission in the steamy Southeast Asian jungles, reorganization was imminent, and the division undertook its first test mission with the reorganization into the TRICAP division. The concept established a brigade each of airmobile infantry, mechanized infantry and armor; and the success of the organization led immediately to another, somewhat related test, this one for the Readiness Command.

MASSTER, the Modern Army Selected System Test, Evaluation and Review, was especially geared to determine the role of the helicopter in a mid-intensity war and to test its effectiveness as a mobile antiarmor attack weapon. MASSTER and TRICAP demonstrated these roles of the helicopter so well that plans were formulated to create an independent air cavalry brigade.

That led to activation on 20 February 1975 of the 6th Cavalry Brigade (Air Combat). Created from the assets of the 1st Cavalry Division, the new brigade became a separate unit under Headquarters, III Corps and Ft. Hood (see January 1980 ***Aviation Digest***).

In 1975 another reorganization made the 1st Cav the Army's newest armored division. With the majority of the division's aviation assets having been formed into the 6th Cavalry Brigade, and with training oriented toward ground maneuver in a probable European scenario, aviation capabilities and assets no longer commanded their former share of internal and external interest. *But as the division resumed its testbed role, its helicopters found a niche in those test missions.*

First Lieutenant Anthony W. Warren

LT Warren was the 1st Cavalry Division Public Affairs Officer when he wrote this article

DIVISION AVIATION

The next major study for the FIRST TEAM was the TACFIRE test, a study examining the use of a computerized artillery fire direction system. Naturally, the division artillery was the priary proponent for the test, but again the division's aviation assets were needed and came into play during the January 1978 field test. Part of the test was to determine if an artillery aerial observer could use computerized equipment while working from a scout helicopter. The concept was proven feasible and the TACFIRE system has been accepted for integration into the Army inventory, with the field artillery aerial observer as an integral part of the concept (see "The Aerial Observer Team and TACFIRE," August 1978 *Aviation Digest).*

In the division's role of test unit, the Division Restructure Study of 1977 and 1978 was probably the most important project undertaken, and DRS had far-reaching implications for 1st Cav aviation. The purpose of the restructure study was to test alternative systems of organization of personnel and equipment in attempts to find the optimum system for adapting to the increasingly complicated and lethal weapons of the coming decade. Under the initial plan the entire division was to be restructured in the third phase of the test. Realizing that the structure of the aviation units would change as well, the DRS test was considered an opportunity to implement the ARCSA III concept (see page 3, August 1978 *Aviation Digest*) into the division. In August 1977 all the division's aviation assets were combined into the 227th Aviation Battalion (Provisional); and the 1st Cavalry Division became the first CONUS armor division to adopt the ARCSA III organization.

FIRST TEAM aviation today is a vastly different system from the division's aviation program during the Vietnam era, but it continues to perform an important mission in both tactical and garrison requirements. Currently the division has two aviation units, the 227th Aviation Battalion and Troop D (Air Cavalry), 1st Squadron, 9th Cavalry.

Still organized under the ARCSA III system the 227th currently has two lift companies and is structured for two attack companies. The attack companies will remain at zero strength for an undetermined time. Delta Troop, 1/9 Cav, the division's air combat power, performs its scout and air cavalry mission as a division asset to be employed by the division commander or the commander's battlefield representative.

As the 1st Cavalry Division pursues its mission of being an increasingly prepared armored division, commanders and trainers are more frequently recognizing aviation for its potential contribution to that mission. The mobility, lethality and responsiveness of the Army helicopter is making it an increasingly important member of the 1st Cavalry Division's combined arms team.

AVRADCOM'S AVIATION LIFE SUPPORT DEVELOPMENTS

ARMY AVIATION has come a long way since its inception in the early 1950s. Development of aviation life support equipment for the Army aviator has not, however, progressed as rapidly as the development of new aircraft systems. To meet this need AVRADCOM established a dedicated ALSE development team in July 1977. This action was taken to develop essential ALSE equipment to meet the challenges of modern Army Aviation of the future. Both Department of the Army and DARCOM have recognized the need for increased emphasis in this area by the establishment of two funded development project lines.

Since mid-1978 the AVRADCOM ALSE team has drafted and staffed four separate requirement documents through TRADOC/DARCOM for approval. Additionally, three more separate requirement documents are being prepared at AVRADCOM and shortly will be staffed to TRADOC for coordination/approval.

Major James Christie is the development project officer designee for ALSE developments at AVRADCOM. This designation was the result of specific direction from DA/DARCOM and signifies the increased importance placed on the overall ALSE development/management functions.

The ALSE development team is presently developing an individual aircrewmember/passenger flotation kit for helicopter use. The flotation kit will be a small, lightweight item which the crewmember/passengers will wear during operations over water. Two separate configurations are planned: one for use in cold (arctic) temperatures and the other for use in warmer (tropic) climates. This kit, which is vacuum packed, will enhance overall crew safety and survivability. The vacuum package aspect will allow a 5- to 7-year shelf life and will minimize maintenance requirements. The flotation kit is presently in DT/OT testing at Ft. Rucker, AL. The item, which will be a CTA item of issue, will complete Government testing in early 1981 and will be fielded by mid-1982.

Development of a helicopter oxygen system will be initiated in 1980. This project is to meet an urgent field requirement for units engaged in search and rescue and high altitude mountain training. It also has application to the UH-60 SOTAS aircraft coincident with its operational concepts. Specific application will be on the UH-1, OH-58, CH-47 and UH-60 SOTAS. The oxygen system is scheduled to enter Army testing in early 1981 and slated for completion in late 1981 and be available to user units in early 1983. The system will employ a crashworthy module concept. This will allow the oxygen module to be taken from one aircraft and mounted in another aircraft without undue delay or modification to the aircraft system.

Another development effort assigned to the ALSE project office is that of a new lightweight, integrated aircrew helmet system to replace the present SPH-4 helmet. This new helmet development will concentrate on better sound attenuation, lighter weight (2 pounds) and better center of gravity alignment. The concept is that the helmet will be a modular type. A sighting system and fire control display are to be added to the basic helmet system. These modules are part of the helmet development program. In addition the helmet will provide laser protection for crewmembers' eyes. The new helmet will enter development in late 1980

Robert A. Matthews
Systems Engineering and Development Directorate
U.S. Army Aviation Research and Development Command
St. Louis, MO

and enter Army testing in 1982.

The ALSE project office is also developing an inflatable body and head restraint system, in coordination with the Navy, to meet an immediate need. The IBAHRS will significantly reduce crash injuries/fatalities to crew personnel. The design concept adapts automotive air bag technology to the conventional aircrew restraint system. The IBAHRS consists of a 'host' restraint system, air bag/gas generators stowed on the inside of each shoulder harness and a remotely located crash sensor. During a crash the crash sensor will send a signal which will fire gas generators, inflating the air bags between the shoulder harness and the crewmember's torso. This action will remove slack from the restraint system and physically force the occupant back in the seat to best survive the crash. Besides preventing the crewmember from striking cockpit structures such as instrument panels and weapons sighting systems, the IBAHRS inflates beneath the chin to help limit head rotation and whiplash. While the IBAHRS has the potential to become the future Army/Navy helicopter crewmember restraint system, its near-term application will be for copilot/gunners of Army attack helicopters (AH-1/AH-64) which have weapons sighting systems protruding in front of the crewmember.

The above are just a few of the ALSE items under development at AVRADCOM. In addition to those, improved crashworthy crew seats, crashworthy troop seats, laser protection devices, emergency locator transmitters and NBC protective systems also will be researched by the AVRADCOM aviation life support team. These new ALSE development items are intended to meet some of the current and future life support requirements for the aviator in the 1980s. There are additional areas of ALSE that need to be pursued, but the above items address the more pressing needs.

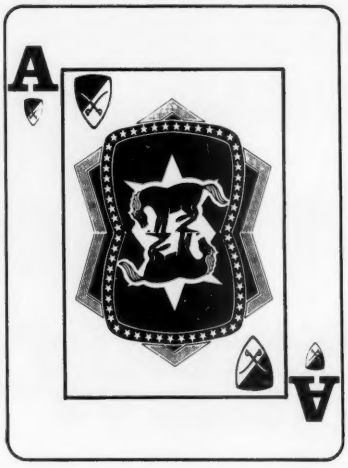
Much is planned for future ALSE; however, unless we know where the voids are, we as a developing command cannot respond to the needs of the field in a timely manner. To that end we ask you to write us and let us know what your ALSE development needs are. You may direct your written inquiries to Commander, USAAVRADCOM, ATTN: DRDAV-EGD (Major Christie or Mr. Matthews), P.O. Box 209, St. Louis, MO 63166; or call AUTOVON 693-1613.

GLOSSARY

ALSE	**aviation life support equipment**
AVRADCOM	**U.S. Army Aviation Research and Development Command**
CTA	**common table of allowance**
DA	**Department of the Army**
DARCOM	**U.S. Army Materiel Development and Readiness Command**
DT	**development testing**
IBAHRS	**inflatable body and head restraint system**
NBC	**nuclear, biological, chemical**
OT	**operational test**
SOTAS	**Standoff Target Acquisition System**
TRADOC	**U.S. Army Training and Doctrine Command**

The 6th Cavalry Brigade (Air Combat)

Plays Its ACE



Major Stephen J. Snow
Major Snow was chief, BAMC, 6th Cavalry Brigade (Air Combat), Fort Hood, TX, when he wrote this article

THE 6TH CAVALRY Brigade (Air Combat), Ft. Hood, TX, is playing its ACE. No, the brigade isn't in a card game but it is currently engaged in wrestling with one of Army Aviation's most difficult and serious problems—maintenance personnel skill enrichment training.

The ACE that the brigade is playing is actually a highly structured intensive training program for armament, communications and electronics repair personnel.

The 6th Brigade's mission is to close with and destroy enemy armor forces. To do this the brigade is equipped with 81 AH-1S Cobra TOW armor-defeating helicopters. These aircraft contain newer and higher degrees of technological sophistication than the AH-1G gunships of old. This new technology brings added combat lethality to the battlefield, but it also brings significant maintenance problems.

Army Aviation has entered an era of more sophisticated armament, communications and electronics with the recent fielding of the AH-1 ECAS Cobra and with the fielding of the modernized Cobra. The latter is equipped with a laser rangefinder and accompanying aircraft survivability electronic apparatus. This influx of complex equipment comes at a time when the Army is simultaneously having a difficult time obtaining and retaining highly skilled and qualified repair personnel.

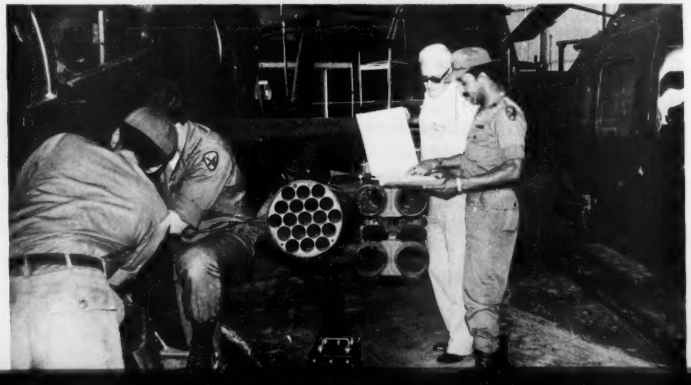
The DARCOM community expects to field at least 40 new combat systems during the next couple of years. These systems, when coupled with already fielded sophisticated systems, present significant maintenance challenges to commanders at every level to achieve optimum combat readiness. This article presents one unit's solution to closing the training/technology gap. The concept is applicable to any organization that has or will have equipment that requires a degree of maintenance sophistication beyond that which is presently available in the organization.

How can we maintain more with less? This is a question that each aviation unit commander must solve in order to achieve the highest possible state of readiness.

The 6th has dealt with this challenge by establishing a maintenance repair training program specifically keyed to meet the advances found in its AH-1S Cobra TOW fleet. The brigade played an ACE.

ACE is consolidation of armament, communication and electronic maintenance personnel and

ACE armament personnel performing maintenance with help from logistics assistance office field representative



equipment within the brigade to form a unique maintenance support concept. The concept is simple—establish a single maintenance repair and training organization to take care of the needs of the brigade. The ACE derives its ability to train and maintain through the consolidation and colocation of the limited number of skilled maintenance personnel. They, in turn, train and supervise the inexperienced and newly assigned repair personnel.

The ACE was implemented originally as a short term program to solve the "now" problems of personnel shortages, skill deficiencies and lower operational ready rates. It became apparent, however, that the concept had an application more encompassing than merely as a quick fix. The brigade experienced a significant increase in operational readiness in ACE systems as a result of the program. Troop morale and esprit de corps increases were noted as a result of increased job satisfaction. Noncommissioned officers' job satisfaction was enhanced as were the NCOs' supervisory and training skills. Indeed, when the brigade took a look at the interim results of the program at the end of 70 days (figure 1), a decision was made to continue the ACE program indefinitely.

The brigade's combat and logistical tacticians had realized that the ACE concept of intensive maintenance management and training was only a different manifestation of the traditional principles of tactical employment, concentration of force and economy of effort. The ACE program provided the commander of the brigade with the opportunity to apply—at the proper time and place—maintenance personnel adequate to solve the present problems at a given point in time. Likewise, the commander was able to make careful use of available resources and concentrate them in a manner which would achieve the objectives.

What are the objectives? How did they come about? To answer these questions we must go back to the ACE program conceptual stage in November 1979. The maintenance managers in the brigade materiel management center had become alarmed at the adverse readiness trends in armament, communications and electronic systems within the brigade. Problem analysis/resolution work sessions were held and several reasons for the gradual readiness decline in these systems surfaced.

- The three-level maintenance concept had reduced authorized skill levels in troop units.
- There was a shortage of authorized maintenance personnel.
- There was a significant shortage of qualified mid-level repair supervisors.
- Newly trained repair personnel are receiving only introductory

Figure 1

Work Requests Received*			Work Completed		
Avionics	Armament	GRD C&E	Avionics	Armament	GRD C&E
866	138	234	791	81	184

ACE Backlog			Total Items Not Completed**		
Avionics	Armament	GRD C&E	Avionics	Armament	GRD C&E
75	57	47	243	87	47

Items Not Completed**

	Waiting Shop	In Shop	DL Parts	EVAC
Avionics	45	19	97	82
Armament	15	9	63	0
GRD C&E	7	3	16	21

*One work request represents one item of repair.
**Backlog status and totals include all job orders previously on hand/other data is for the 70 days ACE has been in operation.

Glossary

ACE	armament, communications and electronics
ARCOM	United States Army Reserve Command
AVIM	aviation intermediate maintenance
AVUM	aviation unit maintenance
BMMC	brigade materiel management center
CERCOM	United States Army Communications and Electronics Materiel Readiness Command
C & E	communications and electronics
DARCOM	United States Army Materiel Development and Readiness Command
DL	deadline
ECAS	Enhanced Cobra Armament System
ED	exempt from duty
EVAC	evacuated
HHT	headquarters and headquarters troop
MICOM	United States Army Missile Command
NCO	noncommissioned officer
OPCON	operational control
SD	special duty
TMDE	test, measurement and diagnostic equipment
TOW	tube-launched, optically-tracked, wire-guided

training in their military occupational specialities and enter the work force at the apprentice level and, therefore, require considerable on-the-job training.

• The preponderance of ACE systems has become sufficiently sophisticated that they require at least journeyman skill level to maintain them.

The BMMC also analyzed the incoming and outgoing personnel situation and determined that immediate steps had to be taken because the brigade was about to lose more than 75 percent of its experienced repair and supervisory personnel within a 120-day period. This would have had the obvious effect of leaving unskilled apprentices working on systems that were well above their current repair capabilities. In fact, this situation could only lead to a further degradation in combat readiness.

So, the objectives were determined: develop a skill enrichment training program that would upgrade the brigade's repair people from apprentice skill level to an acceptable journeyman skill level in the shortest time. Thus, the brigade's combat readiness in armament, communications and electronics systems would be increased.

The AVIM company, C Company, 34th Support Battalion, had the largest armament and avionics shop and the greatest number of skilled supervisory personnel; therefore, it was decided that the AVIM company would become the home of the ACE program.

The concept was presented to the brigade commander in early November 1979 and to the squadron/battalion and separate company commanders later that month. It was modified somewhat from its original all-encompassing concept with functional objectives left intact.

Figure 2

Soldiers were asked what their preference was with regard to the future of ACE. Twenty-two 35K personnel assigned to ACE responded in the following manner:

- **17 would keep ACE as it now exists**
- **1 would move the ACE concept to SQDN level**
- **4 would disband ACE**

Eight 31V personnel special duty to ACE all responded by saying they would keep ACE as it now exists. Armament repair personnel were not formally questioned. However, off the record comments were favorably disposed toward ACE.

The program kicked off on 19 November 1979 and was scheduled to run for 90 days. It would be implemented and operated under the following guidelines:

• All avionics and ground communications and electronics personnel would be OPCON to the AVIM and exempt from duty for 90 days.

• All armament fire control repair people, 68J, from the brigade's cavalry squadron would be OPCON, special duty, and exempt from duty to the AVIM for 90 days.

• The brigade's attack squadron would retain its own AVUM armament support; however, a squadron training program would be initiated.

• All repair services provided by the ACE would be free of paperwork to customer units; that is, ACE personnel would take care of all work requests, logbook entries, etc.

To further strengthen the trainer base, the brigade, working through the AH-1 Cobra project manager office, requested and received the assistance of private industry field engineers from Hughes Aircraft Corporation and Bell Helicopter Textron. A call went out to the Ft. Hood logistics assistance office and the ACE was able to augment its trainer staff by obtaining the services of the DARCOM field maintenance technicians from MICOM, ARCOM and CERCOM.

The ACE was underway! A 90-day experiment, fashioned and implemented all within 20 days; how would it do? This question was on many minds.

As mentioned earlier, the results were impressive (figure 1). The Hughes and Bell field engineers, as well as the logistics assistance office field maintenance technicians, were enthusiastic about the day-to-day results of the program and offered unsolicited favorable opinions to all who would listen.

The consensus from the experts was that this is the type of maintenance training program that should be implemented Armywide. No lip service to training—all action! These field engineers and maintenance technicians all agreed that because of the growing complexity of Army equipment, unique training and maintenance measures will have to be taken if a satisfactory combat operational readiness state is to be achieved.

Figure 3

ACE WORK REQUEST DATA

Backlog Status

As of 19 February 1980				Awaiting Shop	In Shop	DL Parts	Evac
	Work orders received	1471	Armament	8	5	30	0
	Work orders completed	1227	Avionics	25	21	74	45
			Ground C&E	17	7	8	4

ACE production control personnel receive repaired piece of equipment from armament section sergeant. Customers pick up repaired items at this office. Contents of equipment racks in background are representative of daily output

Another significant factor surfaced when a number of repair personnel were queried about their feelings toward the ACE. The troops expressed a great satisfaction with the program. The Soldiers liked ACE (figure 2).

The favorable results and opinions of the ACE program led to the decision to continue the program. Some modifications were made to correct administrative lessons learned during the 90 days that ACE phase one operated. However, these corrections were minor, and the basic concept remained unaltered. ACE phase one ended last February and it had accomplished an enviable work record (figure 3).

ACE phase two began immediately and was organized to provide the services as outlined in figure 4.

What the 6th Cavalry Brigade did with its ACE program was to take immediate action to solve an immediate problem and from this realized that the concept had validity as an ongoing training program. It was a program that would satisfy the skill level requirements demanded by aviation's latest generation of equipment. The program was able to meet the needs of the brigade because:

- It made a large pool of trainers available in one location, thus providing a favorable trainer to trainee ratio.
- It equalized the skill distribution disparities among the units by eliminating the "luck of the draw" phenomenon.
- It provided a greater volume and spectrum of problems for repair personnel to solve, thereby expanding their job knowledge.
- It provided the unit commander with a means to combine military occupational specialty training with Soldier skill training, thus gaining the net effect of having a totally trained Soldier.
- It provided the commander with the capability to place maximum effort, in terms of qualified repair people, on equipment readiness problems in armament, communications and electronics systems and subsystems.

The 6th Cavalry Brigade has dealt effectively with the Army's contemporary problem, that of having sophisticated and complicated equipment to maintain while the ability to retain or to obtain highly skilled maintenance personnel has steadily declined, by developing an intensive maintenance management and training program. Try playing an ACE, it may be the answer to your unit's maintenance training and readiness problems.

Figure 4
ACE Functions

Functions/MOS	ACE	SQDN	Troop	Remarks
Ground C&E 31V	All Org. & DS Maintenance	E7 (31V) C&E Coordinator only	Operator Crew Maintenance	•All 31V's OPCON to C/34 SPT, up to a total of 10 •Newly assigned personnel OPCON for 90 days •Will be in ED status
Avionics	AVIM/AVUM	ACE to provide 2 teams daily to	Limited AVUM	•35K's OPCON to C/34 on 90-day rotation basis ED status
35K	All 35K less 1 per line troop	SQDN maint; 1 two-man team to the 4/9; 1 three-man team to 7/17	Line troop 1 35K	•HHT's receive all support from C/34 •35K's in line troops will rotate every 90 days for training
Armament	All for 4/9	4/9-none	4/9-none	•68J from 4/9 OPCON to C/34 •Newly assigned 68J & Sharp 68M OPCON SD/ED to C/34 for 90 days trng •4/9 TMDE XFR'D to C/34 •7/17 work load C/34
68J	AVIM for 7/17	7/17-Maint Trng	7/17 AVUM	

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

If you have a question about personal equipment or rescue/survival gear, write PEARL, DARCOM, ATTN: DRCPO-ALSE, 4300 Goodfellow Blvd., St. Louis, MO 63120

A "First" For Army ALSE

Congratulations to Staff Sergeant (SSG) Edward W. Bruck of the 478th Transportation Company, Ft. Benning, GA. SSG Bruck was the first Army enlisted man to graduate from the Naval Air Technical Training Center, Lakehurst (NATTCL), NJ Aircrew Survival Equipmentman (PR) School in its 54-year history. He initially became interested in attending the Navy school when, while acting in his capacity as unit aviation life support equipment (ALSE) NCO, he discovered that no one in the company knew much about ALSE. Not only was SSG Bruck the first Army enlisted man to graduate from the Navy "A" School, but he also was graduated third in his class. (Since SSG Bruck's graduation from the NATTCL several other Army personnel have successfully completed the course. Our congratulations go out to them also, but SSG Bruck was a "first" for Army ALSE.)

Summa Cum Laude

"For meritorious achievement . . . while assigned to the United States Army, Europe, Aviation Safety and Standardization Board. Warrant Officer Klindt distinguished himself during the development of the Aviation Life Support Equipment Technical Course. As a co-author of the program, he developed a comprehensive course of instruction on the acquisition, care and maintenance of this equipment. Through his efforts, 14 three-day courses taught throughout the command produced 185 qualified technicians, with a projected first year savings of $1.3 million through proper care and repair. Chief Warrant Officer Klindt's outstanding achievement reflects great credit upon him and the United States Army."

This was the narrative for the Army Commendation Medal, as presented to CW3 David Klindt, U.S. Army Safety and Standardization Board, United States Army, Europe (USAREUR). We add our praise for a job well done.

It's In The Field

Well, we finally have it! The long awaited Training Circular (TC) 1-62, "Aviation Life Support Equipment (ALSE)," has been distributed. This TC will serve to aid the commander in establishing aviation life support system training requirements that will inform the aircrews of the availability and proper use of ALSE. It also establishes guidelines to aid the aviation life support specialist in maintaining and inspecting ALSE. TC 1-62 isn't perfect but it's better than anything we've had before, so use it to your best advantage.

New Inspection Interval II

Last month we told you that the inspection interval for all survival vests had been changed to 30 days. At the time that was true. Now, however, the interval has been changed again, this time to 120 days. Point of contact on this matter is Mr. D. B. Hopkins, U.S. Army Troop Support and Aviation Materiel Readiness Command (TSARCOM), AUTOVON 693-3715.

Meltdown

We have received several phone calls recently pertaining to the candle, illuminating, national stock number (NSN) 6260-00-840-5578, found in the survival kit, cold climate (both RSSK and soft pack). It seems that when exposed to high enough heat these candles tend to melt in spite of their supposed high melting point. Now this is not to be totally unexpected (after all, wax does melt when heated), but it can create quite a mess in your kit when it does happen, not to mention the inconvenience of having to replace the candles. The accepted solution is to wrap the candles individually in a 12 by 12 inch sheet of aluminum foil, removing the paper wrapping that comes with them. This will not keep them from melting, but it will keep the candles from fusing and possibly keep the rest of your kit from becoming contaminated. Of course, if at all possible, avoid exposing your survival kits to extreme heat; and whenever they are not in use, they should be stored in a cool, dry place.

More Butane Lighter Woes

Quality Deficiency Reports (QDRs) recently received from the field indicate that a potential hazard may exist with the new type butane lighter fire starter, NSN 9920-00-999-6753, a component of the SRU-21/P survival vest. The new type lighter can be identified by the screw-on cap and waterproofing O-ring. According to one QDR, during the first scheduled quarterly inspection after issue, the cap from a lighter blew off in the inspector's hand when he unscrewed it. This was due to gas escaping from the needle valve

Anne Arsenault
Photo by Dave Polaski

and subsequently accumulating under the cap and building up pressure. Upon further inspection it was found that metal turnings from the original machining of the needle valve had worked their way under the flat spring retainer of the valve and would not allow it to seat completely, even though the valve control knob had been turned completely clockwise and the valve appeared closed. This same deficiency was found on nine out of nine lighters inspected. A subsequent QDR reported 35 or 36 lighters inspected to have

PEARL'S

metal turnings present and to be leaking butane fuel. It is recommended that all new type butane lighters be inspected for the presence of metal turnings around the needle valve and that inspectors ensure that all valve control knobs are turned completely clockwise and off prior to cap installation.

SPH-4 Bayonet Fittings

For those units using the MBU-5/P oxygen mask in conjunction with the SPH-4 flight helmet, there still exists a problem of how best to adapt the mask to the helmet in order to ensure a proper seal and eliminate leakage. The best way to solve this problem is by the installation of the bayonet receiver fittings, such as the Air Force uses, on the SPH-4. This installation should be accomplished only by a trained life support specialist/technician or a flight surgeon, in accordance with the mounting procedures detailed in U.S. Air Force Technical Order 15X4-4-12. (In the absence of either of the aforementioned, suggest you contact the nearest Air Force or Navy life support facility for assistance.) Procedures for mounting the bayonet fittings to the SPH-4 helmet will be included in the next change to TM 10-8415-206-13.

It is important to realize that placement of the fittings on the helmet is critical and differs from crewmember to crewmember; consequently, the MBU-5/P and the SPH-4 must be fitted and mated on an individual basis. For further information contact Mr. Jim Dittmer, TSARCOM, AUTOVON 693-3715.

Tailor It To Your Needs

AH-1 and OH-58 aircraft crewmembers are at a distinct disadvantage concerning the space and weight available for the placement of individual survival kits in their aircraft; consequently, they are forced to rely almost exclusively on their SRU-21/P survival vest. This vital item of equipment should be tailored dependent upon the unit mission, the terrain overflown, the climatic conditions and, of course, available funding.

Consider the following priorities of the human body for life:

Item	Approximate Time
Oxygen	3 minutes
Climate	3 hours
Water	3 days
Food	3 weeks

Since most Army aircraft don't have oxygen systems and most crews should be located within 3 weeks, oxygen and food requirements can be placed aside for purposes of this discussion. As far as climate is concerned, the body needs protection within 3 hours in extreme climatic conditions. In the case of water, the human body can live for an average of 3 days without water intake. With all of this in mind, let's say an OH-58 goes down in deep soft snow in an area surrounded by trees. The first item needed after the accident is protection from the cold. Space blankets, snow caves and trenches come into play here. Water is available, so the next needed item would be a signaling device. Since class II money is usually in short supply and used for items like SDU-5/E strobe lights, pyrotechnic devices (class V) can be added to the vest via "ammo money," which is usually easier to obtain. Several items that can be used are:

AN-MK 13 Mod O	L275
Starter, Fire M2	L621
Signal, Smoke, Ground	M166/167/168/169

The survival radio is a class VII item and is PEMA (procurement of equipment and missiles, Army) funded, so there is no cost out of unit funds.

The key is that it is up to unit life support personnel to determine the ALSE requirements for their unit. Mission, terrain, weather and the availability of unit funds must all come under consideration. All it takes is for life support personnel to learn a little about supply and funding. (Thanks to CW3 Dave Klindt, U.S. Army Safety and Standardization Board, USAREUR, for this info.)

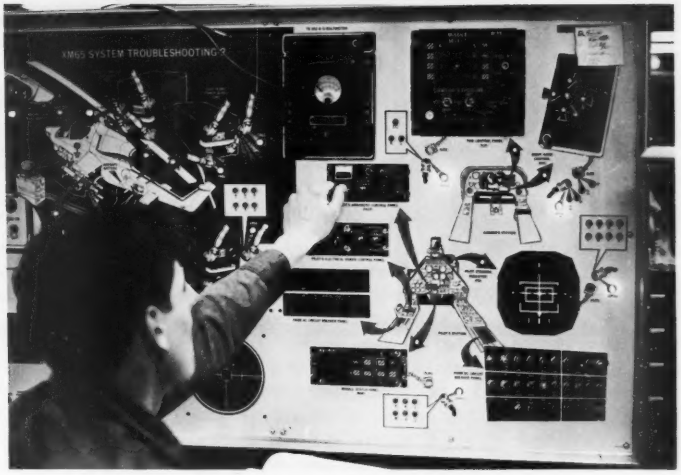
Questions and Answers

What criteria is used to determine the number of first aid kits required per Army aircraft? Our OH-58 aircraft have only one each and we want to know if this is sufficient. A recent article in ***PS*** *magazine mentioned the requirement for the UH-1 aircraft but not for the OH-58.* (CW3 Robert Smith, Test Flight Activity, Maintenance Management Division, Ft. Eustis, VA)

The article you referenced (***PS*** issue 331, June 1980) gives you the basic information for determining the number of first aid kits required for your aircraft. Paragraph 3-19 of Army Regulation 95-1 states that at least one first aid kit will be installed in each Army aircraft and that CTA (common table of allowance) 8-100 should be consulted for the actual number. Paragraph 10-3 of TM 55-1500-328-25 is more specific and says that you will *ensure* that serviceable first aid kits are installed in the quantities specified in Supply Bulletin 8-100. For a more definite answer we queried the U.S. Army Safety Center. Personnel there stated that the number of kits required is determined by both the size of the aircraft and the total personnel capacity. They also stated that, when in doubt, simply consult the TM for the aircraft. No matter how you look at it the number of first aid kits required and authorized for your OH-58s still adds up to one. (Thanks to Mr. L. D. Sand, U. S. Army Safety Center, Ft. Rucker, AL for this info.)

COBRA WEAPONS REPAIR

Public Affairs Office
Fort Eustis, VA



$30,000 educational computer

THE AH-1 COBRA helicopter costs $2½ million. A test set for the armament system on the gunship costs $150,000. At that price not many can be used for training students in fire control repair.

But the Army has a solution. With only a $30,000 price tag per unit it has developed a course that uses educational computers simulating both the aircraft and the test set to train students. Besides that, student mistakes don't hurt the computer; but mistakes on a test set can cause costly damage to either the test set, the helicopter or both, according to SFC Charles R. Clagett.

The senior instructor from the Aircraft Armament Division, Department of Allied Trades, Ft. Eustis, VA, said, "The cost of repairing one of the computer panels is minimal to the cost of repairing an aircraft; and the computers rarely break down, either."

Students learn systems operations and troubleshooting on all models of the Cobra gunship. They use training panels and video screens that are linked to the computer to give them a variety of maintenance problems that must be found and fixed.

There are five different panels used with the computer. Each panel deals with a different part of the maintenance on the weapons system of the Cobra. With the help of the computer the student learns how to use a test set to check the weapon turret, helmet sight subsystem, guided missile and antitank missile launcher system, and mechanical and electrical troubleshooting.

The panel has knobs and dials and lights on it similar to a real test set that actually checks the weapons system on the gunship. Plus, it has schematic drawings to show students which system they are working on.

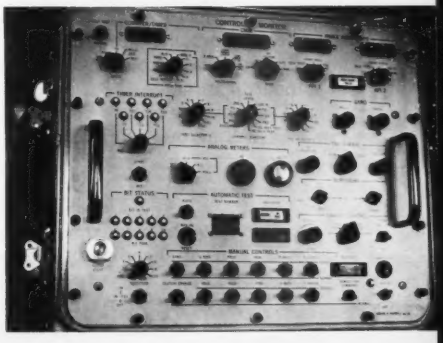
Typically, students learning how to test a certain part of the armament system on the Cobra first select a problem out of their training manual. Following procedures, they then work the test set on the panel. A video screen to the side of the training panel informs the students what is taking place during each step of the troubleshooting procedure. If the students make a mistake, the computer also tells them on the video screen what they did wrong.

After students learn so much they are tested on their new knowledge, either through a written examination or through a practical exercise where they actually get to check the armament system on a real helicopter with a real test set.

"We teach basics and give the student a working knowledge of how to test and repair the armament systems on the Cobra. The field teaches the needed expertise," SFC Clagett explained.

The 19-week fire control repair course guidelines are in AR 611-201 and DA Pamphlet 351-4. Two helicopter missile system repairer military occupational specialties, 68J which works with the electrical components and 68M that is concerned with the mechanical and hydraulic functions of the system, are trained in the course. Available information indicates there are openings in those specialities for applicants who have an electrical motor maintenance score of at least 100 and do not have a profile of anything lower than two.

$150,000 test set



U.S. ARMY
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REPORT TO THE FIELD
DES welcomes your inquiries and requests to focus attention on an area of major importance. Write to us at: Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES, Ft. Rucker, AL 36362; or call us at AUTOVON 558-3504 or commercial 205-255-3504. After duty hours call Fort Rucker Hot Line, AUTOVON 558-6487 or commercial 205-255-6487 and leave a message

IS IT *STANDARDIZATION* OR IS IT *TECHNIQUE?*

IN ARMY AVIATION it is generally considered that *standardization* is the established order of performing certain steps, and *technique* is the manner of performing each of these steps. Standardization may be dictated, but technique always will be the ultimate display of individual knowledge and skill. Standardization can be taught, but technique must undergo personal development. Technique is the individual aviator's personal manner of complementing standardization.

"The Aircrew Training Manual (ATM)," TC 1-145, which will be published in final form later this year delineates a standardized takeoff as follows:

TAKEOFF

Complete the before-takeoff checks. Align aircraft with runway heading. Complete lineup check. Smoothly apply takeoff power. Takeoff power must be applied prior to releasing brakes to obtain the normal takeoff distance given in the performance section of the operator's manual. During takeoff, ensure that aircraft and engine limitations are not exceeded. Monitor engine instruments to ascertain that the engine instruments are showing the proper RPM [revolutions per minute] and manifold/torque indications. Maintain directional control with nosewheel steering and rudder so that the predetermined track is between main gear. Maintain wings level with ailerons. Rotate at recommended rotation speed (Vr) in order to establish a pitch attitude that will allow lift-off at recommended lift-off speed (Vlof). When flight is assured, retract the landing gear (or call for copilot action) and establish the proper initial climb attitude (best rate-of-climb airspeed (Vy)). Retract flaps, if applicable, at best single engine rate-of-climb (Vyse). At single engine maneuvering altitude (not less than 500 feet AGL [above ground level]), adjust pitch attitude to obtain cruise climb airspeed. As cruise climb airspeed is attained, adjust power to the climb power setting

Webster defines *standardization* as: "to make, cause or adapt to fit a standard" and *technique* as: "the degree of skill or command of fundamentals exhibited in any performance"

(maximum continuous or as specified in the operator's manual) and set mixture control, if applicable. Complete after-takeoff check. During crosswind conditions, position the aileron control into the wind at the start of the takeoff roll as if the airplane were being "slipped into the wind." As the nosewheel comes off the ground, the rudder is used as necessary to prevent turning (crabbing) into the wind. To prevent damage to the landing gear in the event that the airplane were to settle back onto the runway, the airplane should remain in "slipping" flight until well clear of the ground and then allowed to "crab" into the wind to continue a straight flightpath.

This is standardization! Let's add some technique.

First, before takeoff clearance is requested, all the before-takeoff checks should be completed, because when the tower gives clearance for takeoff, *you are cleared for, and expected to, takeoff.* You *are not* cleared to taxi into position, hold, set radios and/or perform other time-consuming before-takeoff checks. "Cleared for takeoff" means that the tower expects you to taxi onto the runway, perform lineup check and initiate your takeoff roll. If you have an extended delay on the runway before starting your takeoff roll, you should request it and receive a clearance for the delay. In some cases, due to traffic conditions or IFR (instrument flight rules) separation, you may receive a clearance to "taxi into position and hold." In these cases you will receive another clearance for takeoff, and then you are expected to begin your takeoff roll without delay.

When all checks have been completed and the aircraft aligned on the runway; nose wheel down the center line; heels on the floor; only the balls of the feet on the rudder pedals (any pressure on the brakes, however so slight, even to aid in directional control, will delay aircraft acceleration and lengthen the ground roll); and takeoff clearance is received, you are ready to initiate the takeoff. When you place your right hand on the throttles, the heel of the hand at the base of the thumb naturally rests on the left throttle with the remaining part of the hand on the right throttle. With the hand in this position, as you advance the throttles toward the takeoff power position, the left throttle advances slightly ahead of the right throttle. This produces a slight amount of assymeterical power that counteracts torque (left wing dips) and aids in keeping the aircraft aligned before sufficient airspeed is developed to allow the control surfaces to become effective. As power is increased, torque and P factor forces cause more pressure on the left main gear than the right main gear, causing more resistance to the rolling moment of the left main gear and less resistance on the right main gear. All of these forces are present as the power is advanced—long before enough air is flowing over the controls to keep the wings level and the nose straight by aileron and rudder control alone. As the takeoff power setting is reached, the throttles (because of the hand palm position) naturally align.

For some more technique, if you start the takeoff roll with the control column full forward, the elevator is full down. This down elevator acts as a flap, causing more drag, and tends to cause a nose-down attitude as the airspeed increases, putting more pressure on the nose wheel and causing a negative angle of attack of the wing. All of this causes a further lengthening of the takeoff roll.

As the brakes are released and power advanced, hold the yoke or elevator control in the neutral position. This allows the aircraft to accelerate with the minimum amount of profile drag. As the controls become effective with the increase in airspeed, exert a slight amount of back pressure or up-elevator control to allow the wings to assume a slight positive angle of attack. This tends to transfer the weight of the aircraft from the landing gear to the wings of the aircraft. Don't yank the nose up, but apply a slight smooth increase in elevator pressure so that the airplane will fly off the runway at the precise moment that the airspeed is right for the weight of the aircraft. Lift-off will occur at the predicted speeds on the performance planning card. Any over-rotation, or too much back pressure too early, will create excessive profile drag and delay the takeoff.

As the aircraft smoothly comes off the ground, adjust the pitch attitude for best rate of climb; when safely airborne, retract the landing gear—flaps up at flap retraction speed, allowing the aircraft to accelerate to the desired climb airspeed. Adjust power and pitch to obtain desired climb airspeed and rate of climb; perform after takeoff check.

In the previous discussion, many techniques were applied to a standardized takeoff procedure; yet, standardization was not compromised. Technique, to be effective, always must be applied within the parameters of standardization.

Check Plane

NEW AIRPLANE—This C-12 gives more range and mobility to the U.S. Army Air Traffic Control Activity. Instrumentation added makes it a modern check plane (U.S. Army photos by Ken Pieper)

Al Hinton
Office of the Chief of Public Affairs
U.S. Army Communications Command
Fort Huachuca, AZ

THEY SOUND AS if it's a new toy when they talk about it. But "they" are not kids and "it" is a C-12 airplane with full instrumentation for checking Army airfield navigational aids (NAVAIDs).

They are members of the U.S. Army Air Traffic Control (ATC) Activity's evaluation division, headed by Lieutenant Colonel Douglas H. Snell.

In speaking of the mission of the group, LTC Snell said, "We're probably one of Army Aviation's best friends. We know the status of every ATC facility in the Army."

Their job is to inspect and evaluate Army air traffic control facilities. LTC Snell described their mission as between a general inspection and a command maintenance management inspection.

Starting this year the crew will climb into that new C-12 and take off on unannounced inspections. The facility evaluations begin as soon as they make contact with the tower. That is the type of inspection performed. It is all-encompassing.

The team studies tower operator procedures and language: things like nonstandard directions or responses. They also examine unit training, equipment, maintenance, files and records.

The aircraft itself has lost two seats from its original internal configuration of 10 and gained 170 pounds in a Federal Aviation Administration (FAA) installation of Army-owned monitoring equipment.

The C-12 can fly nonstop almost anywhere in the United States and can carry a normal team of six inspectors. After the team and equipment are transported to the inspection site, the airplane is used for the actual airborne inspection and testing of the facility's navagational aids.

The FAA removed the airplane's original navigational receivers and replaced them with test equipment. The incoming radio signals are fed to both the test equipment and the cockpit instruments. The crew has full capability to test nondirectional beacons (NDB), omniranges (VOR, TVOR), instrument landing systems (ILS) and any other navigational aids the Army uses.

Test gear provides four parameters and 18 channels for recording besides digital readouts. It has two channels for receiving, primarily to be sure one is

TEST EQUIPMENT—This panel of instruments and the recorder next to it is the heart of the test system installed in a new airplane for the U.S. Army Air Traffic Control Activity. It is used to test navigational aids

available at all times, but the team can record and test two omniranges at one time if this is needed. Included among the electronics is a spectrum analyzer to check for radio frequency interference.

The team, whose members are experts, is composed of a team chief, assistant team chief, flight inspection pilot, air traffic control specialist and one or sometimes two maintenance specialists experienced in air traffic control equipment.

Although the Army equipment and specialists are capable of certifying air traffic control and navigational aid equipment, they do not. Only the FAA does this.

The team can close down or restrict any facility that fails to meet established standards. This does not mean that the entire airfield would necessarily be closed down. However, the particular NAVAID that is determined to be below par would be shut down and deleted from the descriptions of equipment available to pilots using the facility. The notices to airmen (NOTAM) file would reflect this condition.

During flight checks of ground navigational aids, one person on the ground with a theodolite tracks the airplane as it goes through its approach. Telemetry instruments feed the readings back to the airplane where they can be recorded to provide a comparison between the airplane's position according to its instruments and its actual position. The test equipment is accurate to within one-half degree.

The variety of navigational aids used by the Army consists essentially of radio transmitters. They do different things with their signals and the receivers in the airplanes do different things with what they receive but, basically, the whole system is radio transmitters and receivers.

The transmitters have to be broadcasting on the right frequencies with the correct amount of power. For a transmitter such as a TVOR (terminal very high frequency omnirange), broadcasting on radials, the radial "fans" have to be of the proper size.

Almost all of the testing has to be done with the airplane in the air. This means the aviator gets a lot of work as does the crew. Since the aircraft flies nonstandard patterns as part of the facility check, controllers issue advisories to other aircraft in the area that a facility evaluation flight is in progress, the aircraft is executing nonstandard patterns and aviators should exercise extreme caution. The ATC activity has permission to paint the airplane in a nonstandard pattern. It is mostly white with large areas of international orange to make it more visible.

The test crew does not repair facility equipment, LTC Snell said. They do help align and adjust NAVAIDs found inaccurate, and, to be sure adjustments are correct, the airplane's systems are recalibrated every 250 flying hours. The two internal systems are also checked against each other.

The primary thrust of the test team is in the United States. The team has a portable flight inspection package that is taken overseas to evaluate facilities there.

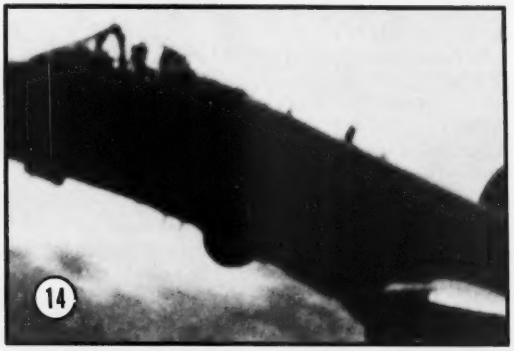
The whole program adds up to an insurance policy, ensuring that the Army has NAVAIDs that can be trusted to work and work right. The pilot whose life depends on Army maintained NAVAIDs can trust them.

Army air traffic control is managed by the U.S. Army Communications Command through its Air Traffic Control Activity, both headquartered at Ft. Huachuca, AZ.

INSTRUMENTS—A package of Army instruments installed in the C-12 by the Federal Aviation Administration use the same radio receivers to provide information to the pilot's instruments and the navigational aids check package

RECOGNITION QUIZ

Monthly Hints: Can you identify the aircraft below? One is fishy; one is not Army; and one is former active Army. Good luck. See the next issue for the answers and a full view of the aircraft.



JULY 1980 RECOGNITION QUIZ ANSWERS

7. OH-58 Kiowa. Army Aviation's scout
8. Lynx. Great Britian's multirole helicopter
9. OH-6 Cayuse. Former scout
10. BO-105. Light utility helicopter of the Army of the Federal Republic of Germany
11. AH-56 Cheyenne. Attack helicopter tested by the Army in the 1960s
12. Mi-24 HIND-A. Soviet attack helicopter, early version.

VOLATILE

SMALL ARMS & HELICOPTERS

DO NOT MIX

Captain E. Gary Campbell
Threat Branch
Directorate of Combat Developments
Fort Rucker, AL

SMALL ARMS ARE effective against low flying, high speed aircraft and helicopters. In the Korean conflict the U.S. Air Force lost 544 aircraft to combined small arms and air defense fire—almost five times as many as were lost in air-to-air combat. In South Vietnam 410 fixed wing aircraft and 2,100 helicopters were lost. Over North Vietnam small arms fire contributed to significant losses of U.S. aircraft. During the Mideast War of 1973 units on both sides used small arms weapons to drive off, damage or destroy attacking aircraft. (FM 44-1, "U.S. Army Air Defense Employment")

The result of the quantitative and qualitative changes in the design characteristics of these American helicopters was that combat operations directed against helicopters have to be conducted not only by antiaircraft defense troops, but also by troops from other armed forces branches and services equipped with other kinds of weapons. *(Przeglad Wojsk Ladowych,* June 78)

Both United States and Soviet Armies recognize the effectiveness of small arms against armed helicopters. However, the Soviet concept of air defense is universal. It ranges from training the lowest ranking infantry troops about the value of their weapons in an antiaircraft role to the use of highly sophisticated acquisition and missile systems to protect all maneuver elements. Surprisingly, Soviet tactics and organizations are still fashioned from experience gained in World War II, especially antiaircraft protection. A hindsight look at Soviet tactical air defense during World War II has discovered it to be "grossly inadequate" in both numbers and the caliber of weapons.

Additionally, the Soviets learned many lessons from our experience in Vietnam. They feel that we relied too heavily on air support as a substitute for infantry combat. Also, the conflict provided them with significant data for "determining the optimum mix of weapons in defense of various ground targets against close air support, including helicopters." Furthermore, it confirmed the value of rapid firing antiaircraft guns and reinforced the *importance* of small arms, antitank weapons and vehicle-mounted main guns in providing a complete air defense umbrella. The Soviets feel they must have overlapping air defense coverage with redundant weapon systems to the point where "in the event of

war, a maneuver enemy could not count on tactical air support."

Therefore, it is imperative that Army aviators know the concept of Soviet antiaircraft employment. Granted, a lot has been written about the threat from the extensive and sophisticated surface-to-air missile systems and antiaircraft artillery in the Soviet inventory. But, because of present employment techniques of our scout and attack helicopters, we cannot afford to overlook the density, lethality and range of motorized rifle unit's small arms weapons.

The Soviets define small arms weapons as armament carried by the infantry troops in the motorized rifle, tank and airborne units, whereas mounted weapons are those guns installed on combat vehicles such as BMPs, BTRs, BRDMs and tanks.

The standard rifle in Soviet units is the 7.62 mm AKM, which is capable of both semiautomatic and fully automatic fire. The AKM has a relatively short sight length with open sights and a semiautomatic range of 300 meters and an automatic range of 200 meters. There are about 10,000 AKMs found in a motorized rifle division. Also, there is a semiautomatic 7.62 mm sniper's rifle (SVD) with an effective range of 800 meters that uses a 10-round magazine. Each motorized rifle platoon has one SVD. The sniper's rifle range can be extended to 1,300 meters by using an infrared-sensitive telescope. The magazine-fed 7.62 mm RPK light machinegun is an AKM with a longer, heavier barrel. It has two magazines—a 75-round drum and a 40-round curved box. Its maximum range is 2,500 meters, and the effective range is 800 meters. There are almost 200 RPKs in the motorized rifle division, with most being found in the BTR-equipped units.

A heavier and longer range machinegun is the 7.62 mm general purpose PK. It has an effective range of 1,000 meters with a maximum range reaching 3,800 meters. The GPPK uses 25-round sections of nondisintegrating metallic feed belts. The majority of the approximately 200 PK machineguns are issued to the BMP units of the motorized rifle division.

The armored personnel carriers (APC) and infantry fighting vehicles (IFV) have a variety of weapons for use against armed helicopters. The basic IFV, the BMP, is armed with a 73 mm smoothbore, short recoil gun that can fire a rocket assisted HEAT projectile out to a maximum range of 1,300 meters, with an effective range of 800 meters. Additionally, it has a 7.62 coaxial machinegun with a 2,000-round basic load and four AT-3 SAGGER antitank guided missiles (ATGMs). The BTR-60 APC has a 14.5 mm heavy machinegun capable of firing HE/AP and API rounds, as does the BRDM-2 scout vehicle. The BRDM can mount three different models of ATGM, including the AT-5. The 14.5 mm heavy machinegun has a basic load of 500 rounds with a maximum effective range of 2,000 meters.

When considering the threat to armed helicopters, the use of handheld antitank grenade launchers and recoilless guns in the antiaircraft role must not be overlooked. All motorized rifle units down to squad level are equipped with the RPG-7 AT grenade launcher. The RPG-7 is a 40 mm rocket-assisted, reloadable grenade launcher which is shoulder-fired. Additionally, the launcher can fire an 85 mm HEAT round. "This type of weapon was used most effectively against low-flying aircraft in Southeast Asia. The HEAT round of the RPG-7 will penetrate 13 inches of armor at zero degrees obliquity, can engage targets up to 500 meters and has a self-destruct range of 900 meters. Testing of the HEAT round fired at a 45-degree elevation resulted in an airburst at an altitude of about 701 meters (2,300 feet) at a slant range of about 920 meters. Although the RPG is an inexpensive and effective weapon it is expected to be replaced by an improved grenade launcher, the RPG-16."

The current recoilless gun in the motorized rifle division is the 73 mm SPG-9 served by a four-man crew, with two weapons per motorized rifle battalion. The munitions for the SPG-9 are similar to the RPG-7 and can penetrate about 350 mm of armor at an effective range of 1,000 meters. The maximum range is 1,960 meters.

The Soviets believe that during the performance of their combat missions, units will be operating under conditions marked by a threat of air attacks. Their mounted weapons and small arms will be the only weapons they can use to provide an effective focal defense against attack helicopters. This situation will occur most often when our helicopters are launching attacks from altitudes of less than 50 meters and from hiding places provided by terrain features. The Soviets also feel that

Combined Arms Assault

this reduces to a few seconds the amount of time that will be available to a unit to prepare to open fire.

Consequently, time is the most important factor when determining whether or not both small arms and mounted weapons can be used against this type of target. In this regard the Soviets estimate that it will be necessary to modify the current communications chain, methods of fire direction, firing techniques, and also to introduce new, more functional methods which guarantee efficient and prompt mission performance. Even the most well-organized fire direction and the selection of the most accurate firing methods will not produce any useful results if troops move too slowly in engaging aircraft.

The Soviets insist that only those units and weapons which are constantly ready to immediately open fire and which are backed up by a well-organized reconnaissance and alert notification system will be able to mount an effective defense against armed helicopters. *For this reason, an infantry company should always have at least one platoon serving as a "watch subunit" which is ready to open fire on air targets with small arms and with all of the heavy machineguns at the company's disposal.* These rules do not apply to offensive and defensive actions in which a company is in direct contact with enemy forces (i.e., when it is operating as a battalion's forward echelon). In this case an infantry company will not detail a unit to be on alert for engaging aircraft with either small arms or mounted weapons.

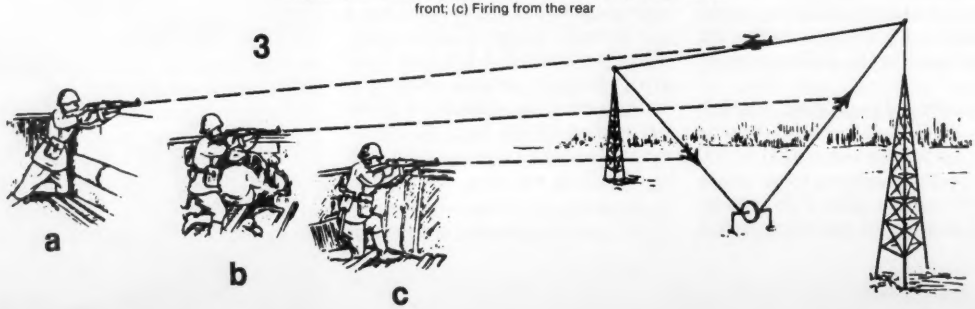
When the air attack alarm signal is given, attacking helicopters will be engaged only by those squads and gunners operating mounted weapons who at that given moment are not directly involved in fighting enemy ground forces. The Soviets perceive that the readiness of a watch subunit is based on the fact that in addition to having a well-organized "circumambient" air-spotting and alert system, its Soldiers must have weapons that are loaded with a ratio of three to four armor-piercing incendiary shells and one tracer shell and are ready for action. The weapons are required to have locked safety catches and preset sights. The Soldiers who are engaged in the performance of observation duties are required to continuously scan their assigned sector.

The Soviet gunners manning mounted weapons, as in the case of the BTR, go to their battle stations, put on their communications headgear, switch on the "electrofiring locks," load the 14.5 mm heavy machineguns, release the bolts on the weapon and "turret-aiming mechanisms," and set gunsights for targets moving at speeds of 285 knots. The Soviets instruct, for safety reasons, that the small arms and the mounted heavy machineguns will not be fired simultaneously from the combat vehicles.

In combat situations units are required to organize circumambient air surveillance systems. Observers wearing headphones scan their assigned sectors with the naked eye from the open compartment slots of the APC or IFV. If units are operating in a fast-march configuration, air-spotting duties are performed by several units. Observers sound the alarm only for those aircraft which are recognized as targets and whose heading or combat actions pose a direct threat to their unit.

Observers performing lookout duties from combat vehicles designate targets by means of an intercom

Organization of Troop Air Defense Training Areas
1 and 2: Training in conducting fire against air targets of various methods in dismounted formation. 3. Training in conducting fire against air targets while mounted in a vehicle; (a) Firing from the side; (b) Firing from the front; (c) Firing from the rear



system, while observers performing duties from outside the vehicle (in dismounted formations) sound the alarms vocally or by means of predetermined signals. Also, signal lights of a predetermined color are used as an additional means of sounding the alarm from APCs. The Soldier detailed to perform this duty turns on the signal light as soon as the observer sounds the alarm over the intercom system.

Observers mark the location of air targets in relation to the direction of the march route, attack or defense (on the march, attack and defensive actions) or in relation to compass points (in staging or troop assembly areas). After having marked the location of an air target and during the time a unit is getting ready to open fire, the observer or commander continues to follow the target's movements and identifies it, making sure that the decision to open fire is correct. If during this interval it turns out that the detected object is not a target, the observer will revoke his decision at once by issuing the command: "Stand fast! Ours!," thereby halting the firing sequence. The same procedures are followed by gunners operating mounted weapons. After marking the location of a target, observers help mounted-weapon gunners to get a fix on the target by transmitting appropriate commands over the intercom system; e.g., "higher!, lower! to the right!, to the left!"

A combat vehicle's commander, to whom the target has been pointed out, will immediately pass on information concerning the target in unaltered form through the company's communications network. This information will be picked up by those unit commanders and equipment operators who are wearing headphones (i.e., vehicle commanders, drivers, mounted-weapon gunners and observers).

The Soviets conducted a graphic time frame analysis of the functions performed by observers, commanders and riflemen when firing small arms at helicopters from an APC. The calculations showed that a unit does not have much time to get ready to fire on slow-flying air targets with their organic infantry weapons. The calculations were based on a helicopter at about 2,000 meters, at an altitude of 50 meters and a flight speed of 95 knots.

Therefore, the Soviets altered their firing procedures so that after the air raid alarm signal is given, each Soldier of the watch subunit independently takes up his assigned firing station, releases the safety catch, chambers a round and takes aim. At the same time the commander locates the target, makes sure that it is an enemy aircraft, and determines the firing technique and the exact time to commence firing. He then designates a firing technique and issues the order to fire. The firing technique depends on the range, about 2,000 meters maximum, at which the target was detected (identified) and the target's heading and flight speed. The order to commence firing depends on the range of the weapons to be used. Therefore, the commanding officer should give the order "Fire!" as soon as the Soldiers have finished aiming their weapons, and as soon as the target has moved in close enough so the first burst of fire will hit it at a range that corresponds to the maximum range of their weapons.

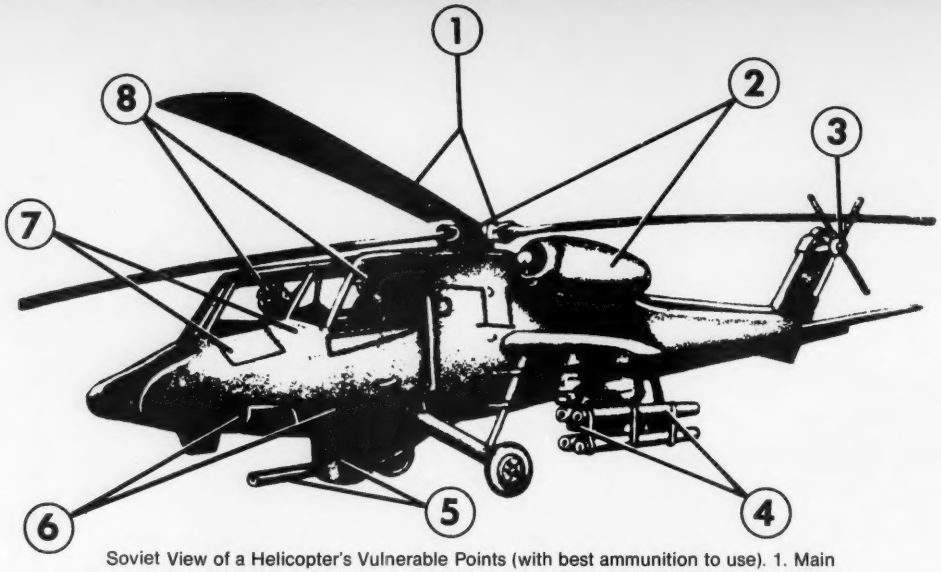
The commander can only issue firing orders to mounted-weapon gunners from the APC's command compartment. The periscope located in this compartment limits his forward field of view to 7.5 degrees. On the right and left sides of the vehicle the field of view is limited and there is no way to make observations from the rear section of the BTR. Under these conditions the commander is unable to locate the airborne target identified by an observer. Even if, under favorable conditions, the commander (squad leader, deputy platoon leader, platoon leader and company commander) were able to spot an aircraft and issue firing orders, it would take too long to do so, and in the meantime the helicopter could fire and take evasive maneuvers.

Riflemen Engaging Aerial Targets

The Soviets conducted another similar time frame analysis of the function performed by the crew using the vehicle-mounted weapons. The procedural time of the mounted weapon, when the gunner was allowed to fire at his discretion, was 22 seconds. In contrast, the procedural time to engage a helicopter with infantry small arms was 146 seconds.

The Soviets arrived at the following conclusions on the basis of this fire control analysis:

- Firing techniques should be decentralized, allowing squad leaders to decide when to open fire on aircraft with small arms in all combat situations, whereas platoon leaders (or company commanders) should be entitled to do so only when certain conditions exist.
- The decision to open fire on helicopters with mounted weapons is to be made by the gunners themselves (in response to an air attack signal received over the intercom system or via company command communications networks), while taking into account the general instructions issued by commanders



Soviet View of a Helicopter's Vulnerable Points (with best ammunition to use). 1. Main rotor—general purpose (GP), and armor piercing incendiary (AP/I). 2. Turboshaft engines (AP/I). 3. Tail rotor (GP, AP/I). 4. Antitank guided missile launcher (GP, AP/I). 5. Cannon on ring mount (AP/I from heavy caliber machineguns). 6. Crew armored areas (AP/I from heavy caliber machineguns). 7. Controls (GP, AP/I). 8. Cabin (GP)

per combat mission orders. Only in special situations will commanding officers be able to direct the mounted weapon gunners' fire.

• In order to reduce the amount of time it takes for a unit to get ready to open fire on air targets, the message formats used by observers and by commanders in issuing orders during the firing of small arms should be modified and abbreviated.

• Steps should be taken to essentially eliminate the company commander's (or platoon leader's) centralized fire direction of a unit's mounted-weapon gunners during the course of repulsing air attacks with respect to the distribution, concentration, redirection or correction of fire. Nevertheless, the Soviets stress that every commander should still strive for a centralization of fire direction, especially when it comes to the distribution or concentration of fire.

In 1967 the Soviet-backed Arab countries failed to adequately protect themselves against Israeli air forces. This brought about an extensive effort to improve the Soviet and Arab air defense protection. Therefore, they developed new systems, refined their antiaircraft technology and improved training. Included in improving training, the Soviets instituted an elaborate program to teach the maneuver units to protect themselves without the broad antiaircraft artillery and surface-to-air missile assets. In 1973 the Israelis' air power was eroded by the improvements the Soviets had incorporated in their antiaircraft protection for ground forces. Admittedly, small arms and mounted weapons did not "do the most damage" —but, they did reinforce the Soviet belief that the maneuver units can provide a highly lethal and extensive air defense coverage that is capable of acquiring and destroying attack helicopter teams.

Tank Mounted Antiaircraft Machinegun

Officer Personnel Management System

OPMS CORNER

AVIATION PERSONNEL UPDATE

Major Jeremiah O'Fihelly
Aviation Plans/Programs
Officer Personnel Management Directorate
U.S. Army Military Personnel Center

New Branch Chief. LTC Joe D. "Dave" Carothers reported in June as Chief, Aviation Plans/Programs Branch. A Senior Army Aviator, he most recently served in the Office of the Deputy Chief of Staff for Personnel at the Pentagon, where he represented that office on the study group and task force developing the revised commissioned aviator career pattern announced by the Chief of Staff of the Army.

Army Officer Named As Astronaut Candidate. Major Sherwood C. Spring has been named as the second Army officer selected as an astronaut candidate (see February 1980 ***Aviation Digest***). On 24 May 1980 the National Aeronautics and Space Adminsitration (NASA) announced selection of 13 military and six civilian astronaut candidates from among 3,200 applicants, which included 143 male and female active, reserve and National Guard Soldiers, warrant and commissioned officers. A Department of the Army selection board nominated 20 officers to NASA, who in turn invited nine nominees to the Johnson Space Center near Houston for extensive evaluation and personal interviews.

Major Spring, a 1967 graduate of the United States Military Academy, is a dual rated combat experienced aviator with more than 2,300 hours; he was graduated from the Naval Test Pilot School in 1975, holds a Master's Degree in Aeronautical Engineering from the University of Arizona, and has extensive experience as an experimental test pilot. Major Spring will report for training at the Johnson Space Center, where he will join the Army's first astronaut, LTC Robert Stewart, in the Space Shuttle Program (see August 1979 ***Aviation Digest***).

New Army Experimental Test Pilots. On 13 June 1980 four Army aviators successfully completed the rigorous 11-month Naval Test Pilot School at Patuxent River Naval Air Station, MD. LTC Robert N. Ward, CW3 Leslie E. Scott, CW3 James L. Webre and CW3 Loran A. Haworth will be assigned to the U.S. Army Aviation Engineering Flight Activity, Eduwards AFB, CA and the Aircraft Developmental Test Activity, Ft. Rucker, AL.

Equalization Of ACIP For Warrant Officers. The Army continues to support equalization of Aviation Career Incentive Pay (ACIP) between commissioned and warrant officer aviators. The Army has forwarded documentation supporting the ACIP equalization issue to the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics for consideration.

A separate but related action on ACIP is a provision of the Nunn/Warner Amendment currently before Congress that provides for a 25 percent increase in the *existing levels* of ACIP. Nunn/Warner does *not* provide for equalization of ACIP. It is likely that final action on the Nunn/Warner Amendment will be taken *prior to* initiating additional legislation to equalize ACIP. Therefore, enactment of Nunn/Warner *should not* be misconstrued as a signal that action to equalize ACIP has again failed.

EUROPE'S HELICOPTER ASSEMBLY POINT

Story and Photos by
SP4 Patricia Butler
21st Support Command
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PUTTING U.S. ARMY helicopters back together again is part of the job of the Soldier/civilian staff at the 70th Transportation Battalion Closed Loop Aircraft Processing Detachment of Ramstein Air Force Base, near Kaiserslautern, Germany.

The 70th's one-hangar workshop is where all Army aircraft arriving in Europe by Air Force transport are assembled and prepared for issue to U.S. Army, Europe (USAREUR) aviation units. Aircraft and aircraft parts (engines, fuel controls, transmissions, tail booms, etc.) being returned to the States for reassignment or rebuilding are also processed for return at the detachment.

Closing Link. Not many of the Army helicopters used in Europe fly there on their own power. They are disassembled and brought overseas on large Air Force transport planes which are rented from the Air Force by the Army.

The closed loop shop is responsible for reconstructing the disassembled aircraft, which are most frequently utility, observation and cargo helicopters.

"The processing point minimizes the time it takes to get the aircraft assembled and into the hands of our customers," said CW2 Roy P. Dean, officer-in-charge of the detachment. "We're the closing link between the depot and the aviation units of the European theater."

Upon arrival at Ramstein, the closed loop crew, aided by Air Force personnel, unload and transport the aircraft and its detached components to the hangar for assembly.

According to CW2 Dean and the shop's noncommissioned officer in charge, SFC Morris Bolling, assembly times depend upon the size and type of aircraft. For instance, a utility helicopter which is shipped with its mast, blades, main rotor hub, landing gear, tail boom and tail blades detached requires about 75 manhours to assemble.

"I think aircraft repairmen have the most important job in Army Aviation," boasted the 70th's SP4 Jose Cortes, an aviation mechanic. "Assembling and disassembling aircraft is a big job and you can't rush it. Sometimes it drives you crazy . . . you have to be very careful and very conscious of what you're doing. Other people's lives depend on the quality of the mechanic's work."

Larger cargo helicopters (Chinooks) which are shipped with their aft pylons, forward transmissions, rotor heads and blades disconnected take about 250 manhours to put together (including the unloading time). Chinook assembly involves proper placement of 77 bolts in the aft pylon alone, a task one Soldier compared to constructing a 5,000-piece jigsaw puzzle in one sitting.

Test Flights. The number of aircraft assembled and issued by the detachment during any period of time depends upon the required strength for any particular aircraft in USAREUR, becoming greater or fewer according to buildup or reduction. Once the helicopters are assembled they're inspected by Gunther Gleich, a technical inspector in the detachment who maintains quality control and performs the final inspection of each aircraft.

CW2 Dean, who has 7 years experience as a pilot, performs the airworthiness test flight after the inspection to determine if the aircraft

Placing some of the 77 bolts in a Chinook's aft plyon is an engrossing job

is acceptable for issuance to another unit, a job he seems to enjoy.

"It's rewarding to put out a good product," he remarked. "When you certify an aircraft, you're signing your name to it and guaranteeing that the aircraft is capable of sustained flight."

The frequent offloadings, assemblies and test flights require CW2 Dean and his staff to work closely with Air Force personnel.

That includes frequent communication with Air Force CPT Jeffrey Sonntag, chief of airfield management at Ramstein, who said he enjoys the interservice aspect of working with the Army's processing detachment.

"It's rare for the Army and Air Force to work together at other than staff levels," he commented. "There have been incidents in the past where the Army's expertise has really helped us out. It is a pleasure to have them here."

An Army helicopter is unloaded from an Air Force transport

Ramstein, a NATO air base, is said to be the busiest Air Force airfield in the world. Therefore, swift transferral of the aircraft from the runway to the assembly hangar is necessary so other runway business won't be interrupted or delayed. Rapid removal is also required should any of the Army's aircraft fail to fly properly.

"They have a big responsibility," CPT Sonntag continued. "If anything goes wrong with their aircraft, they may be inhibiting 15 nations. But so far, their performance has been nothing but commendable."

WORD SEARCH

S D N I W E C A F R U S A R D O N C N
E R O B A N I C H O G P Q E M B R X O
N A E Y Y E A I M H A O F B G N I C I
I U V T U R B U L E N C E E A P S A T
L Y W E E O J A G Q F W I B E D E S A
L F O W T M U N T K A O B I R T U L T
L L D U E B I O D L E O V A X U T E I
A B E A Z N C T O B E W Z B S A C R P
U A D N T D O M L Z P A E K G D F J I
Q P S H O Z F L I A H J V W N K H O C
S R G Q T X N H M I N I H L I G O I E
Q I H Q U Y E K U V C O T G L I G B R
L Z K B Y G X W J L J A S R I S B D P
P A D U M S E O D A N R O T E Q E Y Z
O C T D O F N P E K A F D I C P C O B
T H U N D E R S T O R M L X W E Y A Z
I M S V C E N Q R B F L W G O X F H A
W T Y T I L I B I S I V W O L U O F B
A X O P V T U I T B Q C F X E Z O P E

Permission has been received to reprint from the March 1980 issue of ***FAA WORLD*** the following Word Search by Barbara Andrews of the Flight Service Station, Fayetteville, AK:

There are 13 terms dealing with thunderstorm hazards hidden in the puzzle; one word is circled to get you started.

The terms read forward, backward, up, down and diagonally, are always in a straight line and never skip letters. Terms may overlap and letters may be used more than once.

See how many you can find and rate yourself according to the key below. Answers are on page 35.

13 terms—Walks on water consistently
11-12 terms—Walks on water in emergencies
9-10 terms—Washes with water
7-8 terms—Drinks water
Less than 7—Sleeps on a water bed

MONTHLY WRITING AWARD

What follows is a true experience that occurred when the author was a new aviator in his first aviation assignment. Though written years ago and then forgotten, CW3 Porter felt crewmembers would benefit from reading this—in his words, "The more we share of our past in Army Aviation the better off we will be in the future"

One Flight

CW3 Michael F. Porter
63d Co, 1st Aviation Brigade
Warrant Officer Senior Course 80-2
Fort Rucker, AL

IT WAS A HOT, humid night, characteristic of Vietnam during the monsoon season. I was a new pilot in an assault helicopter unit based on the coast east of the Central Highlands. Being a new pilot it was my responsibility to go to operations to pick up the mission assignments for the next day. I would then hand them out to the various aircraft commanders. Actually this was a relatively easy task because the Officers' Club was just a short walk from operations and this was the usual gathering point for all of the pilots.

I quickly found most of the aircraft commanders where I expected to find them, all except Jerry, whom I was assigned to fly with. Jerry was one of the most experienced aircraft commanders in the unit. This was going to be my first time flying with him and I was looking forward to it. He was one of the few pilots in our unit at that time who treated each mission as a challenge; the challenge was to accomplish each flight in the safest possible way while still completing the mission.

I found Jerry in his tent and told him that we would be flying together. We had an administrative mission up to Dalat and then to Baloc to pick up a passenger to fly back to our home base. Both of these towns were in the mountains, so the flight had to be made during the morning. This was extremely important during the monsoon season because by mid-day all of the routes out of Dalat and Baloc would be engulfed by clouds.

For the most part, this was one of the best missions to fly because most of the pilots could stay in Dalat later than they should, get weathered-in and be forced to stay overnight. Dalat not only had nice hotels and good restaurants, but it also had some forms of entertainment to help pass away boring hours.

Jerry went over the mission with me and briefed me thoroughly as to what my copilot duties would be. Since takeoff time was 0630 Jerry recommended I get a good night's sleep because he was going to let me do most of the flying.

Normal wakeup time was one and a half hours before takoff, so 0500 hours came early. I met Jerry and the rest of the crew at the aircraft (UH-1 Huey). During preflight we found a few minor deficiencies in the aircraft and we elected to have maintenance correct them prior to taking off.

Getting our aircraft ready took maintenance longer than we had expected. We finally broke ground around 1130 and climbed to 5,000 feet. While I flew, Jerry checked in with our flight following service and gave them our route and estimated time of arrival at Dalat.

As we approached the mountains small clouds were already developing over the peaks. Jerry scanned the horizon and decided to climb to a higher altitude and fly direct to Dalat. I felt that this was a bad decision because we were instructed by SOP (standing operating instruction) to follow assigned flight routes. Even with this in mind, I didn't question Jerry about his decision. After all, he *was* the aircraft commander and he *knew* the area far better than I did.

Thirty minutes after we had changed our course the clouds around Dalat built up extremely fast. We could barely see Dalat, which was located on a plateau in the middle of the mountains. Jerry took over the controls of the Huey and expertly guided the aircraft between the vertical buildups. After circumnavigating the city Jerry set up a short final to the airport and I contacted the tower for our landing clearance. I requested fuel but Jerry told me to cancel that request because he didn't want to take time to refuel. Jerry pointed to the south and said if we didn't hurry and drop our load, it wouldn't take long for those clouds to drop over Dalat and then we wouldn't be able to get through the pass which led to Baloc.

Jerry stated that he didn't have any intentions of getting weathered-in at Dalat. He had been in Vietnam for about 10 months and had never remained overnight intentionally.

After dropping off the cargo Jerry hovered our aircraft over to the runway while I contacted the tower. After receiving our clearance I noticed a difference of 400 feet in the ceiling since we had landed. I'll always remember that 400-foot drop in the clouds, because within 10

minutes we had lost 50 percent of our ceiling along with a decrease of a mile in visibility.

We took off and headed south toward the pass. Now Jerry seemed rough on the controls and his relaxed posture was no longer visible. I asked him if he felt all right. I received no response.

It didn't take long to reach the pass. We started to descend from the mountains to the lower area, following the highway which linked Dalat and Baloc and which was listed as a preferred route. As I looked ahead towards Baloc all I could see were clouds and what seemed like heavy rain. The whole valley *looked* worse than what we had experienced at Dalat. It didn't take long for us to find out that it *was actually worse.*

The ceiling dropped to 100 feet or less and we were engulfed in rain. I couldn't see a thing, and Jerry wasn't doing any better. He was still following the road by looking down through the chin bubble. I asked him if we shouldn't turn around and head back to Dalat. Jerry responded angrily to my suggestion and said all we had to do was follow the road and we wouldn't have any problems avoiding the mountains which flanked the highway.

I glanced at Jerry's hands and they looked like he was hanging on the cyclic for "dear life." I remembered how my hands looked on the controls when I was in flight school and how my instructor was always telling me to relax.

A couple of times we lost sight of the road. What was actually a short period of time seemed like an eternity to me. All I could think of was how funny it would be to end up crashing into a mountain and walking to Baloc in the rain.

Suddenly we broke out of the clouds. In front of us was the biggest mountain I had ever seen. Instantly, both of us realized we had been following the wrong road. Jerry put the Huey in a sharp right turn and somehow we missed hitting the trees on the hillside. We spotted another road, which went around the base of the mountain. As we followed it to the other side, I looked at the fuel gauge—it showed 200 pounds of fuel.

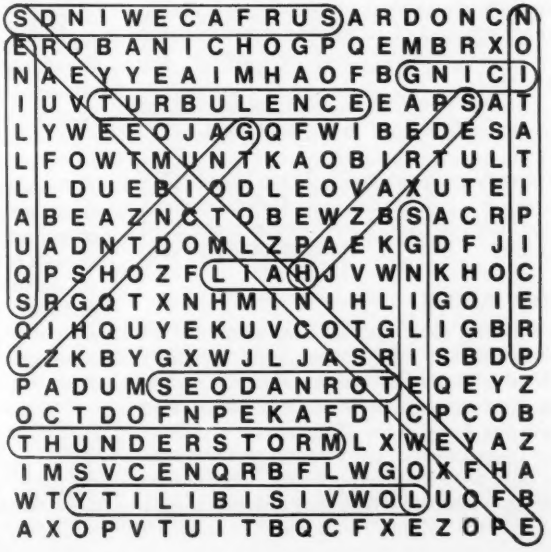
Because we had followed the wrong road, we were running dangerously low on fuel. It was then that Baloc came into view under a bright sun. We had made it and not in the most respectful manner either.

After landing, Jerry told me that he couldn't understand why he had flown that way. It seemed like all he could think of was to complete the mission; and anyway, the guys back at our unit would really kid him if he had to stay in Dalat because of the weather. Jerry then asked me why I hadn't suggested returning to Dalat. I stated I had, however, that it appeared to me that he had already made up his mind. After thinking about my comment Jerry said that he never heard me once say anything in the cockpit. In fact, he really didn't seem to remember much at all about the flight between Dalat and Baloc.

Our flight back to home base was uneventful. One thing is certain, we both learned that one's pride and the attitudes of fellow pilots can greatly influence a crewmember's usually level-headed, professional wisdom.

WORD SEARCH

answers for page 33


S D N I W E C A F R U S A R D O N C N
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N A E Y Y E A I M H A O F B G N I C I
I U V T U R B U L E N C E E A P S A T
L Y W E E Q J A G Q F W I B E D E S A
L F O W T M U N T K A O B I R T U L T
L L D U E B I Q D L E O V A X U T E I
A B E A Z N C T Q B E W Z B S A C R P
U A D N T D O M L Z P A E K G D F J I
Q P S H O Z F L I A H J V W N K H O C
S R G Q T X N H M I N J H L I G O I E
O I H Q U Y E K U V C O T G L I G B R
L Z K B Y G X W J L J A S R I S B D P
P A D U M S E O D A N R O T E Q E Y Z
O C T D O F N P E K A F D I C P C O B
T H U N D E R S T O R M L X W E Y A Z
I M S V C E N Q R B F L W G O X F H A
W T Y T I L I B I S I V W O L U O F B
A X O P V T U I T B Q C F X E Z O P E

Reporting Final

Late News From Army Aviation Activities

FROM FORT RUCKER

General Merryman Reassigned. After 18 months as commander of the Army Aviation Center, Ft. Rucker, AL, MG James H. Merryman assumed new duties 28 July in Washington, DC. His replacement has not been named.

The two-star general recalled that he participated in the initial discussions about arming helicopters when he was stationed at Ft. Rucker in 1956-57.

"Army Aviation has changed since that time," he said, "from what some described as taxi and bus driving to a combat arm , and it will play a major role regardless of where the Army has to fight in the future because it offers a capability not found elsewhere."

C Troop to be Reactivated. Ft. Rucker will have its first combat aviation unit when "C" Troop, 1st Squadron, 6th Cavalry Brigade (Air Combat) is reactivated from Ft. Hood, TX. Preliminary work began in March, and the operational date is scheduled to be 1 December. Troop commander is MAJ Charles R. Poulton II.

The unit will have about 200 enlisted persons and officers to fulfill its twofold mission of maintaining combat readiness and of supporting Army Aviation Center activities (testing doctrine, tactics and equipment, etc.).

It will be housed in the 1st Aviation Brigade area at Ft. Rucker and will operate its 33 helicopters out of Guthrie Field.

Others already assigned to "C" Troop include CPT Ray Krause, CPT Bill Tanner, 1LT David Downey, SFC Richard Benson, SFC Benny Romano and SSG Gerald Hendrix. **(USAAVNC-PAO)**

FROM FORT EUSTIS

OH-6s Phasing Out. The last two stock OH-6A Cayuse helicopters in the active Army inventory recently lifted off from Felker Army Airfield heading west. The light observation helicopters that entered service with the Army in the 1960s are on indefinite loan to the Department of Immigration and Naturalization for duty with the Border Patrol. OH-6s were familiar sights in Vietnam where they teamed up with AH-1 Cobra gunships to form deadly hunter-killer teams. The OH-6s were stationed at Felker for teaching maintenance procedures to Army National Guard aviators. It has been replaced by the OH-58C Kiowa and OH-6s now are assigned to guard units. Two modified OH-6s remain with the active Army for testing and experimental work at Lakehurst, NJ.

Safety Award. CW3 Peter J. Smith, Ft. Eustis aviation safety officer, recently accepted the U.S. Army Training and Doctrine Command Commander's Aviation Accident Prevention Award on behalf of Felker Army Airfield Aviation Division for having no accidents during fiscal year 1979.

Involved were 41 aircraft, 79 aviators and 5,827 flying hours along with all the crewmembers; instructor pilots; maintenance, standardization and service personnel; the air traffic control people; the Air Force weather detachment; and the Aircraft Repair Section of the Directorate of Industrial Operations. **(PAO)**

FROM TRADOC

Army Branch Immaterial Officer Candidate Course. If one of your goals is to become an Army officer, consider the Army Branch Immaterial Officer Candidate Course (BIOCC). If you are an eligible warrant officer or enlisted member on active duty, at least 19½ years of age, but will not reach your 30th birthday on or before the date of enrollment, you may apply for BIOCC.

Other prerequisites are: completed, or be credited with, at least 2 years of a 4-year college degree program; achieve an aptitude area GT score of 110 or higher, attain a score of 115 or higher on the Officer Candidate Test (OCT); and achieve a minimum composite score of 200 on the OCT and Officer Qualification Inventory (OQI). Female applicants must achieve an aptitude area GT score of 115 or higher on the Army Classification Battery (ACB).

Physically you must be free of all defects which would interfere with the performance of duties as an officer and leader. Additionally, you will be required to meet certain visual and weight standards.

Candidates receive, as a minimum, the pay of a sergeant, pay grade E5. Selectees in higher grades will continue to receive the pay of that grade. Upon commissioning, you will incur a 3-year service obligation.

If you are enlisted, you may apply for BIOCC any time after completing advanced individual training. Eligible warrant officers may apply at any time. If you will have 10 or more years of service by the date of commissioning you need not apply.

If you feel that you meet the criteria for BIOCC, the first person you should talk to is your unit or company commander. That is the first person in the chain of command who will be involved in the selection process. Your commander will evaluate your leadership potential as well as your sincere interest in becoming an officer.

After your application has been processed, a written notice will be sent informing you to appear before a board of officers for an interview. During the interview current events and topics of general public interest will be discussed. You will be observed on your reactions, behavior and the logic you apply to the answers given. Shortly after the interview you will be notified whether or not you have been accepted.

Detailed information on the BIOCC program can be found in AR 351-5. BIOCC is a challenging and rewarding experience. **(TNS)**

FROM WASHINGTON

Humanitarian Service Medal (HSM) Award Approved. Personnel who directly participated in disaster relief operations on Majuro Atoll, Marshall Islands during the period 27 November 1979 through 8 January 1980, and Alabama Hurricane Frederic Relief Operation, 12 September 1979 through 23 February 1980 are eligible for award of the HSM. Further information may be obtained by contacting the Personnel Actions Section, Adjutant General Division, AUTOVON 221-5215/3318. **(MILPERCEN)**

Calendar of Events. The Helicopter Association of America has scheduled the following events:

- 2 to 4 December 1980:
  HAA and National Aeronautics and Space Administration Workshop
  Hyatt Rickeys
  Palo Alto, CA
- 10 to 17 January 1981:
  HAA Management Course XI
  Furnace Creek Inn
  Furnace Creek, CA
- 18 to 21 January 1981:
  HAA's 33d Annual Meeting and Industry Exposition
  Anaheim Convention Center
  Anaheim, CA

For further information contact: Walt Rossbach or Chuck Tuori, Steven Paton Associates, 7217 Lockport Place, Lorton, VA 22079. **(HAA)**

FROM FORT WORTH

First Army Aviator Flies XV-15. Major Ron Carpenter is the first active duty U.S. Army pilot to fly the XV-15 tilt rotor aircraft. He made the flight 9 June at Bell's Flight Research Center in Arlington, TX. The Army project test pilot for the XV-15 program flew Aircraft No. 2 at speeds up to 190 knots during the 45-minute flight. He said that the acceleration and deceleration were excellent and the aircraft's conversion from helicopter to the airplane mode went very smoothly.

Major Carpenter's flight, made with XV-15 project pilot Dorman Cannon, included normal takeoff, hover, and sideward flights and slow and 12-second conversions.

A few days later (17 June) the XV-15 exceeded an unofficial world's speed record for rotorcraft by achieving a true airspeed of 301 knots (346 miles per hour) during a level flight at a density altitude of 16,000 feet. XV-15 project test pilots Cannon and Ron Erhart made the flight at the company's Flight Research Center in Arlington.

In April 1969 the Bell Model 533 high performance helicopter set an unofficial speed record of 274 knots (316 mph). It was the first rotorcraft in the world to fly faster than 300 mph in level flight.

Since it entered flight tests a little more than 1 year ago, Aircraft No. 2 has accumulated in excess of 45 flight hours in about 65 flights. The aircraft is scheduled to be delivered to NASA's Dryden Flight Research Center at Edwards Air Force Base, CA this summer.

Aircraft No. 1 is being refurbished at the Ames Research Center, Moffett Field, CA. This ship made the first XV-15 hover flight in 1977 and defined the initial envelope for flight tests of the second aircraft through wind tunnel tests.

Both aircraft eventually will undergo an extensive evaluation program at NASA to assess their applications in military and civil transport requirements, including flight operations on aircraft carriers and offshore oil rigs. **(BHT)**

James M. Boen
Public Affairs Office
U.S. Army Troop Support & Aviation
Materiel Readiness Command
St. Louis, MO

WOOD CHOPPING SNAKE

composite rotor blade with torn trailing edge, afterbody and nestled tip

USUALLY A major tree strike by a helicopter results in a catastrophic accident, but there is evidence that improved composite rotor blades increase chances for crew survival and reduce aircraft damage. New evidence recently has been provided by an unplanned demonstration. The description below vividly shows an actual tree strike with the composite blades.

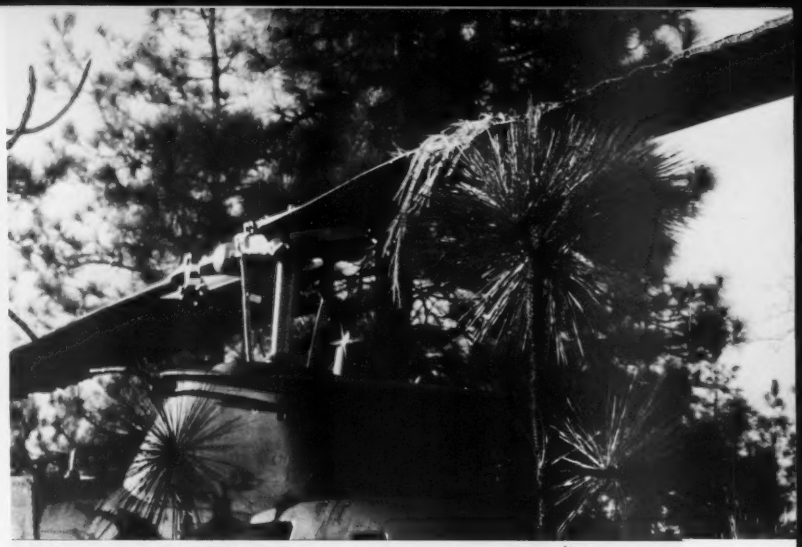
The attack helicopter crew had been briefed on their mission, the aircraft had been inspected, fueled and readied for flight. The takeoff was routine and the flight crew maneuvered into position for the simulated antiarmor mission. During the target acquisition phase, while the AH-1S Cobra was performing an out-of-ground effect (OGE) hovering maneuver, the tail rotor struck and cut the top 10 feet out of a 60-foot pine tree. The loss of tail rotor control forced the flight crew to land the helicopter immediately. An autorotation was initiated and as the Cobra descended to the ground, the main rotor blades came into contact with a 50-foot pine tree. The blades severed four sections of the tree ranging from 7 inches to 9.5 inches in diameter. Despite these repeated tree strikes

the transmission was not displaced and the main rotor blades remained attached to the damaged Cobra. The helicopter continued to the ground in an upright position.

This helicopter is equipped with a canopy removal system (CRS). The CRS is a self-contained pyrotechnic device which cuts the windows and doors free from the helicopter, thereby giving the crew a quick egress in an emergency. Since the helicopter landed in an upright position there was no need to activate the system. The crew did not panic as proper emergency procedures were followed and a normal egress was accomplished.

A visual examination of the helicopter accomplished by qualified maintenance personnel indicated there was no apparent damage to any root hardware of either blade, rotor hub, mast or rotating flight controls. The helicopter involved in this accident was an AH-1S ECAS (Enhanced Cobra Armament System) equipped with the improved main rotor blades which are made of composite materials.

What was the damage to the main rotor blades, you ask? Well, the impact with the trees occurred in the outer 2 feet of the blades. On one blade (S/N A2190) the leading edge erosion guard received a spanwise slit of 20 inches from blade station 235 to 255. Some underlying areas of the frangible leading edge filler were broken with related damage to the spar under the filler. A kink existed in the spar (including the brass weight) at blade station 250. Shape and direction of the kink indicated that the blade was at nearly full collective pitch at the time of impact. The remainder of the blade damage indicated high edgewise bending, with compressive failure of the trailing edge spline, and diagonal buckles in the skin; but little spar damage inboard of blade station 220. The afterbody was damaged extensively due to contact with the tree. As a result sections of the core and about 8 feet of the trailing edge spline were missing or torn loose on both blades. The stainless steel tip cap was still attached but slightly loosened on blade A2190. On the other blade, A2194, damage was similar in appearance except that the brass spar weight did not appear to be bent nor was the stainless steel cap loose. Incidentally the brass weight weighs 54.85 pounds.

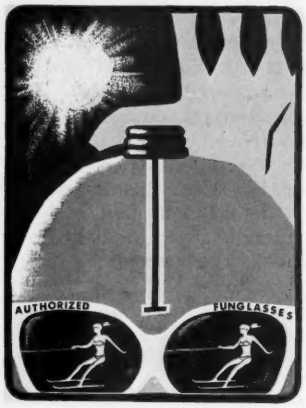


helicopter with bent rotor tip nested in tree

It is noteworthy that in spite of the fact that both blades received repeated severe structural impacts, they remained essentially intact and connected to the helicopter. Since all components remained intact the flight crew was not injured. Major tree strikes of this magnitude generally tend to rip the transmission from its mounts due to the centrifugal force. When this occurs the following blade dips forward striking the cockpit. These two events would generally cause two fatalities.

The resulting damage is shown in the photographs. These photographs give vivid examples of the inherent resilience and energy absorbing characteristics of the composite main rotor blade and its enhancement of the Cobra's survivability. The most outstanding survivability aspect of this event is that the crew returned to flight status 3 days after the accident.

VIEWS FROM READERS



Editor:

Having read the excellent article "Blackhorse," 6th Cavalry Brigade (Air Combat) by COL Molinelli and CPT Russell, in your January issue, it strikes me that we have two major cavalry formations of the same name. The 6th Cavalry Brigade and the 11th Armored Cavalry Regiment.

As a lifetime member of the Blackhorse Association (11th ACR) and a member of that unit when it was awarded the Blackhorse Patch (11th ACR) at Blackhorse Firebase, RVN, I was not aware of two Blackhorses. Is this an association like the Rangers and Female Soldiers, two authorized black berets?

LTC Bob E. Shambarger
U.S. Army Combined Arms
Training Activity
Ft. Leavenworth, KS 66027

• The *Aviation Digest* received the following response from the Center of Military History, HQDA, to LTC Shambarger's question:

The provisions regarding special designations are set forth in paragraph 9-4, AR 870-5. As stated therein, the use of special designations is subject to the approval of this office (Center of Military History).

"Blackhorse" has been approved as the official traditional designation of only one unit, the 11th Armored Cavalry. The designation, "Blackhorse," has never been officially approved for use by the 6th Cavalry Brigade, although "Blackhorse Brigade" is used unofficially by that brigade. "Blackhorse" has also been used unofficially by the 2d Brigade, 1st Cavalry Division.

COL William F. Strobridge
Chief, Historical Services Division
Center of Military History
Washington, DC 20314

Editor:

I have a couple of suggestions for your . . . Foreign Object Damage poster depicted in the April 1980 issue of the *Aviation Digest,* on the inside back cover.

First, draw another circle in the vicinity of the mechanic's left hand, which can be seen grasping one of the main rotor blade grip reservoirs.

Then, title the poster:

FOREIGN OBJECT DAMAGE
Watch Those Hands and Feet!

Maybe then some of us ham-handed pilots and mechanics will think twice before we grab any old handhold or saunter around on the top of an aircraft.

CPT Alan W. Moffatt
Chief, Acft/CE Branch
13th COSCOM
Ft. Hood, TX 76544

See photo right

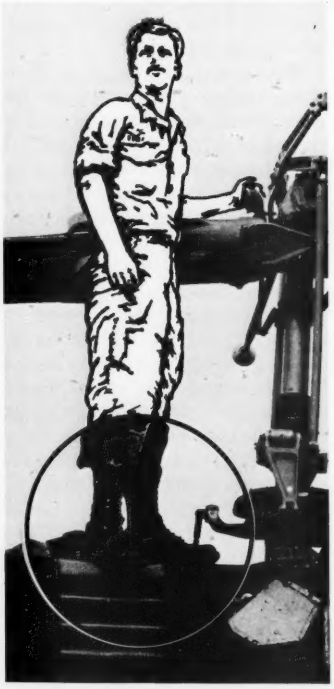
Editor:

In reference to the back page editorial on FOD of the April issue, I would like to submit my caption for the poster.

I feel that since it was my suggestion to make a poster from the picture it is only fitting that I submit a caption for your consideration. My caption is:

Watch your step!
We want to wipe out FOD in YOUR lifetime

Nicholas Winter, DAC
WL-10 TDASMA
Moore Army Airfield
Ft. Devens, MA 01433



Adapted from THE BRAIN: THE LAST FRONTIER by Richard M. Restak
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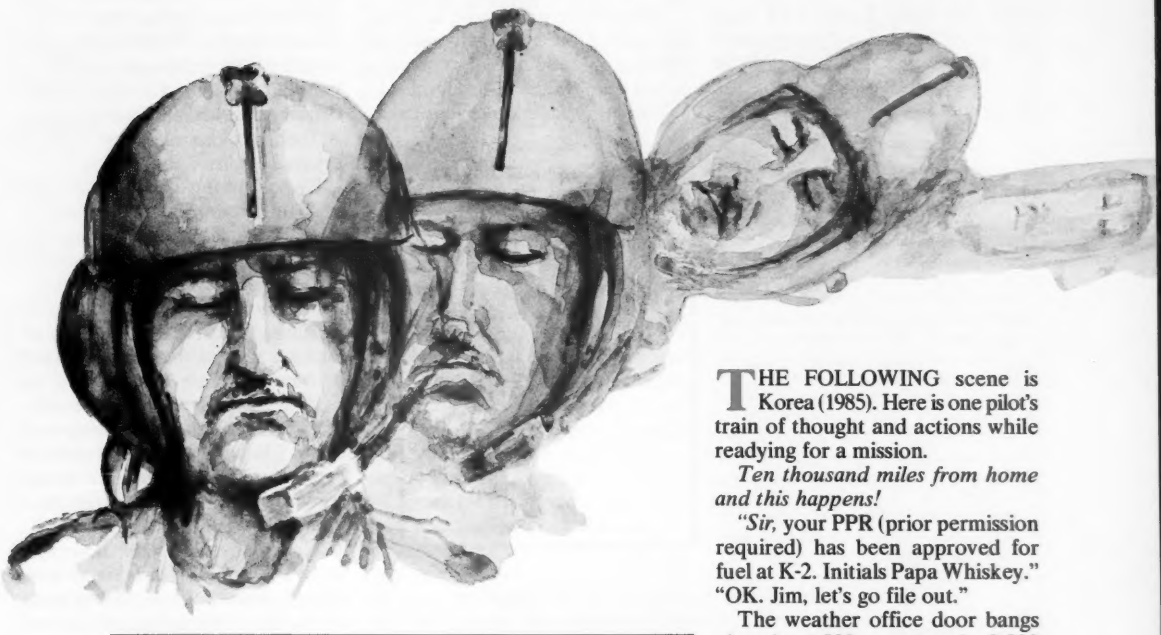


Aviator Stress

Operational stresses and personal problems can put you out in right field—picking daisies. Stay on the ground if you have a problem!

CW3 William D. Watson

THE FOLLOWING scene is Korea (1985). Here is one pilot's train of thought and actions while readying for a mission.

Ten thousand miles from home and this happens!

"Sir, your PPR (prior permission required) has been approved for fuel at K-2. Initials Papa Whiskey." "OK. Jim, let's go file out."

The weather office door bangs closed. 1,500 scattered—2,500 broken—Who would think they'd meet? El Paso has more than a million people. If I were home, maybe I could do something! I should have told Sheila I was married.

The dispatcher hands back the flight plan. I never thought things would get so serious.

The next desk—at the same office.

Oh, God, what about little Ronnie? You'd think she would at least talk to me for Ronnie's sake—a child needs a father while growing up—but she won't say a word, *not* one word! I stay up half the night trying to get a call through and she won't even talk to me, just says, *"Sign the divorce papers!"*

When I get down I'll try to call from the club. Maybe I can get her to talk to me this time. At least I can get smashed again while trying.

"OK, I'll sign for both vests." The aviator turns to leave. "Sir, you forgot

your P300 check." "Oh yeah, I forgot." The aviator steps forward to a small computer-like machine, inserts his IDENTA-PLATE and places his forehead to the bare metal that makes up the viewer. After watching a series of light flashes for 15 seconds, a tone signals that the test is complete. On top of the machine are a green and a red light. The red light is glowing softly.

This incident may not be far away. Emanuel Donchin, University of Illinois, is studying a brain wave called the "P300." Mr. Donchin believes this brain wave represents the decisionmaking process in the brain. The wave appears 300 milliseconds after an *unexpected* stimulus. It doesn't appear after an *expected* stimulus. The stimulus used in the experiments was a series of light flashes or loud and soft clicks. Once established, a stimulus pattern is then broken and the P300 is created (figure 1).

By comparing a person's normal P300 (assuming it was normal to start with and there is one on file) with the current P300, an abnormality on the ground or in flight could be detected in minutes or seconds. Whether these abnormalities are caused from self-imposed or emotional stresses, illness or senility (as I suspect was the case with some old-time colonels and CW4s I have flown with) would be irrelevant. The individual would know that there is a problem that should be corrected.

These ideas are nice; however, we are stuck with subjective and empirical methods of determining when someone is behind the power curve.

The February 1976 ***Aviation Digest*** article "Fatigue" lists some of the signs and symptoms of mental, physical and physiological stress (figure 2). Unfortunately, the list includes everything from a pain in the neck to daydreaming about your last romantic encounter. If it is usually the individual flying with an overstressed pilot that first spots the deficient behavior, the individual will have to:

- Fly with the pilot.
- Know the pilot well enough to note a decrease in efficiency (some people wander around daydreaming all the time anyway).

If an overstressed condition is recognized the observer must be in a position to get the mission canceled or get the crew changed.

- *Get mission canceled.* You average aviators picture yourself initiating the following transmission:

"Redleg 6 this is Serpent 17. Ah, we're just too tired to fly for you

Decisionmaking Wave?

Emanuel Donchin of the University of Illinois believes a wave that appears on an electroencephalograph machine following an unexpected stimulus indicates when a person is weighing a decision. The EEG tracing above shows one person's response to an expected stimulus (broken line) and an unexpected one (solid line). The stimulus is a flash of light in a series, illuminating the letters A and B. When the subject was uncertain whether an A or B was coming next, a dip occurred in the solid line 300 milliseconds after he saw the letter. This wave, the P300, is associated with decisions.

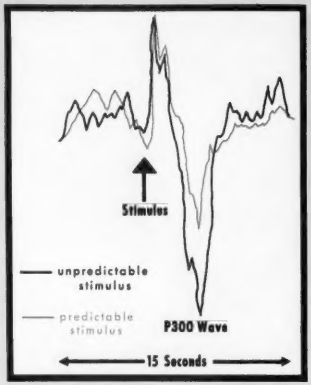


Figure 2—Signs and Symptoms of Fatigue (Mental, Physical and Physiological)

Physical exhaustion.
Increased effort to carry out work.
Increased rate of errors, especially at end of mission.
Tenseness of body muscles; stiff neck; tremor.
Tendency to doze; need of sleep.
A feeling of "not being sharp."
Unusual difficulty in following instructions; things seem hazy.
Need to recheck actions; uncertain about decisions.
Diminished range of attention; deterioration in judgment.
Acceptance of greater tolerances in instruments and controls.
Acceptance of unnecessary risks.
Vague headaches.
Increased startle response.
More frequent sighing.
Irritability, fault-finding, impatience, temper flareups.
Unusual preoccupation; forgetfulness.
Sense of discomfort and failure.
Boredom; loss of motivation; lack of group interest.
Tendency to carelessness.
Inability to concentrate.
Increased reliance on coffee, tobacco and alcohol.
Loss of appetite and weight.
Social withdrawal; resentment toward others.
Nonconformity; asocial acts.
Decreased personal cleanliness.
Insomnia, nightmares, radical change in sleep habits.
Confusion, chronic anxiety; fearfulness; depression.
Vague chest pains, difficulty in breathing.
Vague visual and/or auditory disturbances.
Failure to integrate instruments as a unit.
Unaware of errors and error accumulation.
Splitting of complicated tasks into component parts.

***Aviation Digest,* February 1976**

any more today, so we're going to mosey on home now. Ya'll have a nice day. Hear?"

• *Get crew changed.* Inbound dialogue with operations—

"Yes, sir, I figured you'd get a call from 6."

"No, sir, I didn't know we don't have any more pilots."

"Yes, sir, I know Redleg 6 writes your report card."

"Yes, sir, I know you write mine."

"But sir, I've identified signs of acute fatigue in John."

"Yes, sir, John's got a pain in the neck, and I'm not much better—I can't stop thinking about the last time I was with my old girl friend. Boy she was good . . .!"

Then there's the final exchange on the subject: "Redleg 6, this is Serpent 17, we'll be staying with you as long as you need us this evening, over."

Sometimes we are asked to perform to the limit of our endurance. Knowing when to yell "uncle" is a complicated decision and should be called in advance of takeoff when possible. Even when you decide to throw in the towel it is often thrown back very quickly for reevaluation.

An ongoing study published by the ***Aviation Digest*** (November 1975) indicated that the Navy is moving ahead with something a little more concrete for measuring individual aviator stress.

Life change units (LCUs) are used as indexes measuring the percent chance that one may encounter illness or accident. The higher the total number of units the greater the likelihood of illness or accidental injury (figure 3).

Let's take a look at our opening aviator who reported to Korea recently for a short tour. Poor devil had forced marital separation and was facing a divorce. The Navy system would rate the pilot:

Marital Separation	65
Divorce	73
Wife Begins Work	26
Revision of Personal Habits	24
Change In:	
Work Responsibilities	29
Living Conditions	25
Work Hours or Conditions	20
Residence	20
Recreation	19
Social Activities	18
Sleeping Habits	16
Eating Habits	15
Total LCUs	350

According to the study 79 percent of the people with LCUs above 300 reported illness or injuries. Our aviator may have been coping with all of these factors (which anyone knows is rough but can be done) until receipt of an envelope from his wife's lawyer. *Total operational stresses and a personal crisis put our aviator out in right field—picking daisies.* Cases have been recorded where individuals under tremendous pressure may have crashed and taken their lives purposely.

Again, take a look into the future.

"John, we've got a master caution. I can't see which one because of glare. Check it!" As John reaches down and shades the panel the letters —PILOT—pop into view.

"Redleg 6 this is Serpent 17, we have a warning light. We'll be returning to base, over."

In the future we may have perfect system integration of people and machines, people operating machines and machines monitoring operators. Until that time the best we can do is try to understand what a ***fragile*** part of that system the ***operator*** really is.

Figure 3—Life Events Ranked by Adjustment Required

Rank	Event	Mean Value
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Changes in family member's health	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in no. arguments with spouse	35
20	Mortgage over $10,000	31
21	Foreclosure of mortgage or loan	30
22	Change in work responsibilities	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begins or stops work	26
27	Begin or end school	26
28	Change in living conditions	25
29	Revision of personal habits	24
30	Trouble with boss	23
31	Change in work hours, conditions	20
32	Change in residence	20
33	Change in schools	20
34	Change in recreation	19
35	Change in church activities	19
36	Change in social activities	18
37	Mortgage or loan under $10,000	17
38	Change in sleeping habits	16
39	Change in no. family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

Aviation Digest, November 1975

CW3 Watson has been an Army aviator for 11 years. He is an instructor pilot and instrument examiner, and also holds FAA certified flight and ground instructor ratings. CW3 Watson has a BS degree from Embry-Riddle Aeronautical University and is currently enrolled in graduate work with the University of Southern California branch at Ft. Rucker, AL.

The U.S. Army Aeromedical Research Laboratory has conducted a series of investigations to determine the visual impact on Army aviators when their aircraft act like a bucking bronco. This article reports some of the interesting results which should assist flight planners to realize the workload effects to pilots as a function of vehicle stability. The end results should be to either provide better flight stability or to increase crew staffing requirements to ensure completion of the military mission

The Bucking Bronco Syndrome

Ronald R. Simmons
Research Psychologist
U.S. Army Aeromedical Research Laboratory
Fort Rucker, AL

RIDING A VERY docile horse is an easy, pleasant job. It doesn't require a great deal of effort to stay on. But let that horse become less than docile (unstable), and you have a different story. When the bucking starts, you grab the reins and pull, tighten your knees and hold on, and yell for mercy. Sometimes this will suffice and in 5 minutes you have that bucking bronco under control. Sometimes it takes longer than 5 minutes or you are thrown—you crash. Whichever happens, you are worn out and it is definitely not the same as riding docile old Betsy.

Aircraft, at times, can be accused of having this bucking bronco syndrome. Like the bronco rider the pilot with a stable aircraft has time to control the vehicle. However, instability of the vehicle increases the pilot's workload and the pilot, like the bronco rider, must control the vehicle or crash. When the pilot fails to regain control it is often called "pilot error."

The difference between the rider and the pilot lies in determining whether the vehicle or the operator created the instability. The horse becomes totally unstable regardless of the rider's inputs; the aircraft starts with a certain level of instability and becomes worse as a function of the pilot's inputs (or lack of inputs) to the system.

We should not imply that pilots have an internal drive to create unstable situations. However, if we rule out this death wish by the pilots as the cause of accidents, other alternatives must be explored to explain the vast pilot error accident statistics.

The visual processes of pilots become suspect when you realize that 90 percent of all pilots' decisions and flight control inputs are based on what the pilots see. Possibly the proper visual cues are not available to the pilots or total workload requirements are so great the pilots lack sufficient time to process all they do see.

Based on past research experience, the visual inputs required to fly an aircraft can be divided into three broad categories: basic vehicle stability, barrier avoidance and navigational tracking. Naturally, basic vehicle stability takes precedence over the latter requirements. The pilots' visual requirements can be further separated into three major zones of common areas of visual interest.

The highest priority zone, zone 1, contains visual cues which provide information relating basic vehicle stability about the aircraft's three major axes of pitch, yaw and roll. In other words, if the aircraft is out of control in a spin about these axes, the pilots will not worry about maintaining airspeed plus or minus 5 knots. The second zone includes vehicle speed, altitude, and rates of

climb/descent information to support the first area and to provide more precise vehicle control.

The last zone has vehicle status information. The engine oil temperature, fuel pressure or electrical gauges provide the operator visual feedback of the vehicle's operational condition. As long as these instruments do not enunciate a vehicle malfunction, this zone of visual inputs has the lowest priority for being monitored.

The three zones of basic stability are the key to measuring workload in terms of pilot visual overload or failure. Only as the requirements of the zones are kept within acceptable limits will secondary tasks of barrier avoidance or navigational tracking be attempted.

The U.S. Army Aeromedical Research Laboratory (USAARL) at Ft. Rucker, AL initiated a series of investigations to demonstrate and research the "Bucking Bronco Syndrome." The first question was to determine if pilots' visual workload increased as a function of contrasting stability characteristics of aircraft in the current Army fleet. Next, the question was would operators' visual workload be increased by decreasing the stability of the same aircraft.

The method of collecting the pilots' visual workload data was presented last month in the ***Aviation Digest***. The UH-1 Huey helicopter and the U-21 Ute fixed wing aircraft were selected to explore the differences in pilots' visual workload. These aircraft have drastic stability differences. The U-21 can, on a fairly calm day, be trimmed to fly hands off a long time. In contrast, the UH-1 requires constant control inputs.

The subjects, six UH-1 instructor pilots and six U-21 instructor pilots, flew under instrument flight rules (IFR) with no outside references. Each set of pilots began the flights with an instrument takeoff (ITO) from Cairns Army Airfield, performed basic IFR flight maneuvers, and finally flew the instrument landing system (ILS) approach back to Cairns airfield. The flight profile is shown in figure 1.

During all research flights the pilots' visual workload was recorded. Since we were to determine if visual workload could be related to stability, the standard instrument panel for both aircraft was divided into the three zones of information—basic stability, precise information and vehicle status.

Zone 1 was selected as a single value which would accurately represent the pilots' workload to maintain the aircraft stability. The results of the study are represented by the graph in figure 2. The solid bar represents the visual data of the pilots flying the UH-1; the broken bar that of the pilots in the U-21. The elevated UH-1 values reflect more visual performance/workload required to maintain basic aircraft stability with the UH-1. The greater visual performance workload, of course, allowed the UH-1 pilots less time to monitor all other aircraft instruments. The basic assumption that aircraft aerodynamic characteristics could create differing degrees of visual workload to the pilots of as much as 20 percent (i.e., the ITO) were amply demonstrated.

To answer the second question, that decreased stability of the same vehicle could increase pilots' visual workload, another six UH-1 pilots were flown only in the UH-1 helicopter. If the stability were decreased enough, the pilots could be forced into a visual overload situation and would ultimately fail to maintain aircraft control.

The visual workload in the first experiment reflected, that of all the IFR maneuvers, the ITO required the highest level of work. This maneuver starts from the ground at a point of total stability, leaves the ground into total instability, and recovers into normal stable flight. This happens in fewer than 20 seconds and therefore causes only a short burst of high workload.

Based on the assumption that slower airspeeds in the UH-1 create a less stable platform and that times of 1 minute or longer drive the visual workload of the pilots to very high levels, we started the pilots flying at normal cruise flights under simulated IFR conditions. After a time period, each pilot was required to reduce the airspeed in 10-knot increments and maintain cruise conditions for another period before decreasing another 10 knots. This flight continued to zero forward airspeed or until the pilot lost control of the aircraft—whichever happened first. To reduce the effects of wind the flight courses were flown with either a crosswind or tailwind.

Figures 4, 5 and 6 demonstrate how the visual behavior changed as a function of the different airspeeds (and therefore less aircraft stability). The dots are the areas where the pilots looked to gain their vital information, and the lines represent the scan pattern adopted. Figure 4 is the visual activity at 80 knots, figure 5 is at 40 knots, while figure 6 is at 30 knots just prior to the safety

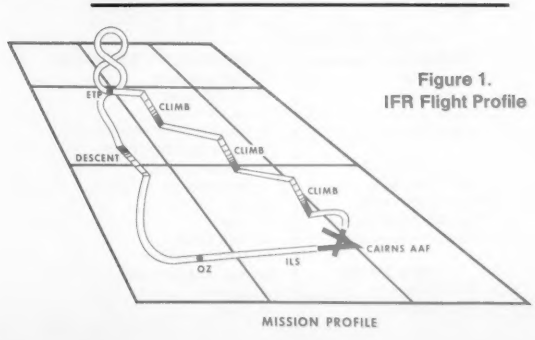


Figure 1.
IFR Flight Profile

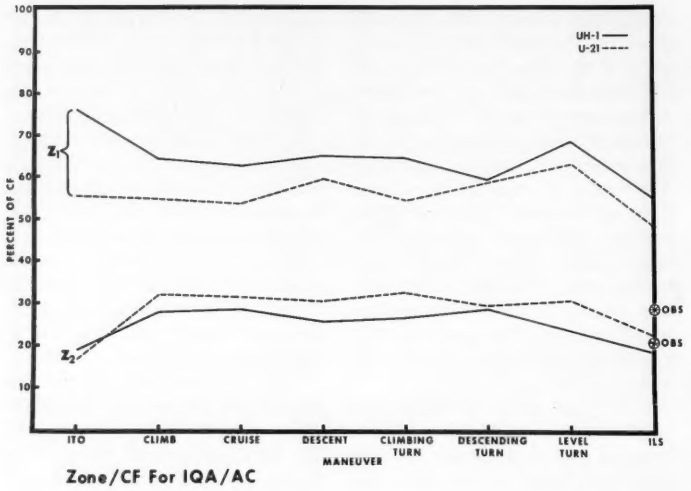


Figure 2.
Comparison of Workload
in the U-21 and UH-1

Key

CF Cost factor or percent of visual workload

Z_1 Workload to maintain aircraft stability

Z_2 Vehicle speed, altitude rate climb/descent (support for more precise control)

OBS Omnibearing selector (course deviation indicator)

pilot recovering from an unusual attitude.

The first visual strategy the pilots adopted was to decrease the number of areas they were willing to monitor. The pilots lost control of the aircraft in a flat left spin because they were unwilling (or lacked sufficient time) to monitor the turn and slip indicator or any other instrument that would provide yaw information.

Bottom line—what could all this mean?

First, the simulated flight just described could be the same scenario as inadvertent instrument meteorological conditions (IMC). The pilots would be low to the ground attempting to see outside. At the same time the pilots would reduce airspeed to have more time to see any obstacles before hitting them. At this reduced speed, when outside references are finally lost, the pilots' visual workload on the instruments is already beyond their capability to recover the aircraft and spatial disorientation will result in other IMC accident statistics.

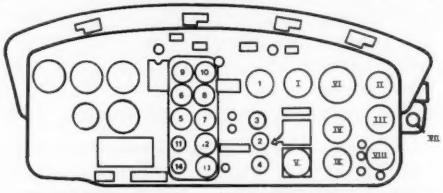
The key point is that given sufficient time, pilots are quite capable of visually perceiving and mentally processing the information necessary to fly their aircraft. When compared with the workload changes of perceiving and processing information, the physical demands on the pilots are not great. As an example, compare visual flight rules (VFR) flight with its outside references in which the visual cues are integrated and pilots lazily look at one point on the horizon, with IFR in which they must gather the visual cues from several instruments. The physical demand for either flight remains the same. However, the workload of the pilots' perceiving and processing channels has greatly increased during the IFR flight.

Finally, even during normal IFR cruise the pilots have more than sufficient time to monitor all instruments for safe flight. One can quickly appreciate that the transition from VFR to IFR during inadvertent IMC pushes pilots to the natural time limits of their processing information capabilities.

Is there any hope?

One could argue that if the instrumentation were arranged better or integrated better the pilots' perceiving and processing workload would be sufficiently decreased. On the other hand, if the UH-1 had the same stability inherent in the U-21, the pilots' workload could be re-

Figure 3: UH-1H Instrument Panel Index (for figures 4, 5 and 6)



ENGINE PERFORMANCE

1. Engine RPM
2. Gas Producer
3. Torque
4. Exhaust Termperature

OIL STATUS

5. Trans Oil Pressure
6. Engine Oil Pressure
7. Trans Oil Temperature
8. Engine Oil Temperature

FUEL STATUS

9. Fuel Pressure
10. Fuel Quantity

ELECTRICAL SYSTEM STATUS

11. Main Generator
12. DC Voltmeter
13. AC Voltmeter
14. Standby Generator

FLIGHT DISPLAYS

I. Airspeed Indicator
II. Altimeter
III. VSI
IV. RMI
V. Turn & Bank
VI. Artificial Horizon
VII. Magnetic Compass
VIII. Clock
IX. VOR

duced by 10 to 20 percent. This reduction could be effectively used for secondary tasks—navigation, scouting or weapons delivery. Or, reduction could just represent increased time for pilots to recover from "pilot errors."

Pilot error, consequently, has been shown to be the case during an airline research study reported by J. Senders that revealed that airline pilots, on the average, make no fewer than 15.6 errors an hour. "Fortunately, large commercial aircraft have a great deal of inherent stability designed into them and therefore aren't violently perturbed by minor errors; as a result, pilots have time to detect—and correct—their mistakes." (Senders, J. 1980. ***Psychology Today***).

Whatever the answer one should remember the natural rule: When the vehicle (aircraft or horse) reaches a certain point of instability, the operator will have difficulty processing the needed information in time to prevent the ground from coming up to smite him or her!

If you read this article but missed "Aviator Stress" beginning on page 41 you may find it helpful. That story discusses mental stress imposed on aviators as a result of family and other personal crises.

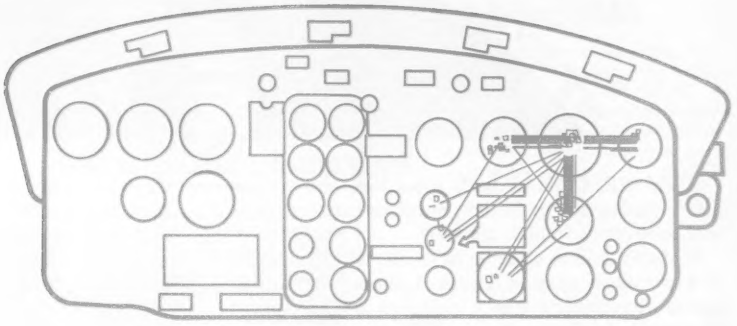


Figure 4.
Visual Activity
in UH-1 at 80 Knots

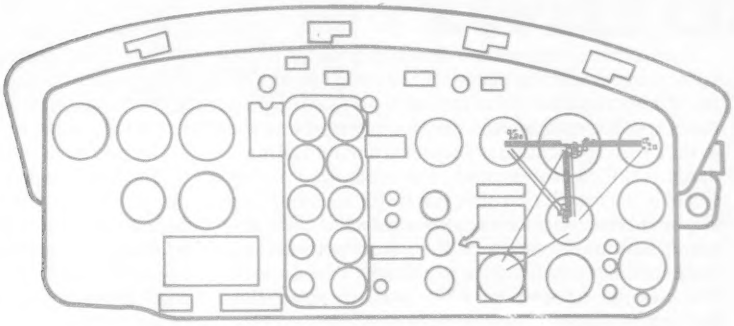


Figure 5.
Visual Activity
in UH-1 at 40 Knots

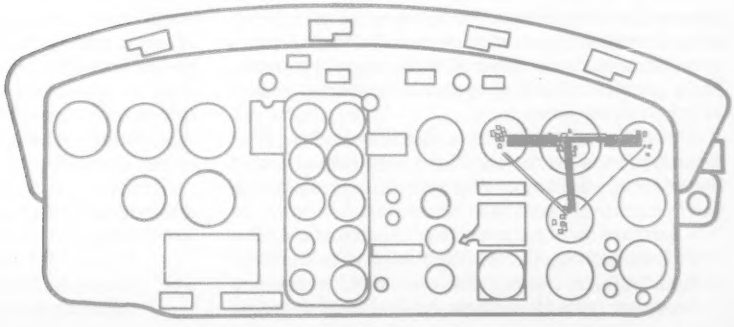


Figure 6.
Visual Activity
in UH-1 at 30 Knots

ATC ACTION LINE

UNITED STATES ARMY COMMUNICATIONS COMMAND

THE ARMY HAS both specialists and professionals active in the daily interface between pilots and controllers. Which are you?

Webster defines a specialist as one who is devoted to a special occupation. The professional is identified as one who characterizes or conforms to the technical or ethical standards of a profession. An individual worthy of the title controller or pilot is both a specialist and a professional.

Controllers combine their devotion to an air traffic control career with the highly refined traits they exhibit in their own application of technical and ethical standards as skilled professionals. For example, a professional in their own application of technical and ethical standards as skilled professionals. For example, a professional in the art of controlling air traffic is obviously a very experienced and capable controller who has mastered the techniques of the job so well that the image of the professional is projected into the cockpit. These people size up the traffic situation and provide the best possible service, e.g., least complex, clear, concise standard phraseology and the shortest routing without being asked. Their degree of professionalism is easily recognized in the cockpit and becomes contagious to those airborne folks, thereby contributing to crew alertness and resulting in increased safety of flying operations.

A pilot's professionalism is also reflected in his or her attitude toward the job. This may be demonstrated by the use of an example of questionable professionalism. Visualize if you will—

Joe Doe received a weather briefing and filed a VFR (visual flight rules) flight plan with the local flight service station (FSS) at 0700, estimating departure from Home Base AAF at 0900 the same day with 10 hours en route to final destination. The trip included three stops along the way for lunch, light supper and refueling purposes. The weather briefer cautioned the pilot to check the weather periodically by contacting other FSSs while en route.

The aircraft departed at 0900 sharp and the final flight plan data was zipping over the teletype net to the destination FSS within seconds. About 1 hour later the aircraft crashed in a wooded area. If the pilot tried to communicate his distress beforehand, he was not heard.

At 2100 the destination FSS alerted the rescue coordination center to the situation and furnished the pertinent details of the flight in question.

The situation described did not actually happen—*or did it?* The example simply points out what could happen when the intent of the VFR flight plan is negated with the filing of an "elongated" flight plan. It appears that pilots may not be aware that filing such a flight plan is not too smart (professional) and that any inconvenience they feel will be caused by filing at each stop is well worth it in terms of ensuring that someone takes prompt action to come looking in the event a mishap has in fact occurred.

Truly professional pilots and controllers realize that it's up to them to help each other do their jobs in the safest, most efficient manner which is mutually beneficial in obtaining a common goal—mission accomplishment.

Readers are encouraged to address matters concerning air traffic control to:

Director
USAATCA Aeronautical Services Office
Cameron Station
Alexandria, VA 22314

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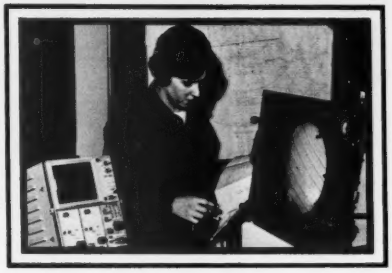
ATC Awards

Army Air Traffic Controller of the Year for 1980

SP4 Debra Baldwin concentrates on her duties at the Laguna Army Airfield tower, Yuma Proving Ground, AZ. Controllers are constantly responsible for human lives and millions of dollars worth of equipment. (U.S. Army photo by Robert V. Hohman)

Army ATC Maintenance Technician for 1980

SP4 Mary E. Mitchell performs maintenance on a ground controlled approach radar. SP4 Mitchell is stationed with the 189th Air Traffic Control Company, Ansbach, Germany. (U.S. Army photo by Robert V. Hohman)



TWO ARMY COMMUNICATIONS Command air traffic control (ATC) personnel and one facility have been named the best in the Army for 1980.

SP5 Debra E. Baldwin, Yuma Proving Ground, Yuma, AZ, was named the Army Air Traffic Controller of the Year. SP4 Mary E. Mitchell, 189th ATC Company, 5th Signal Command in Germany, was named ATC Maintenance Technician of the Year. The control tower at Wheeler Air Force Base, Ft. Shafter, HI, was named Facility of the Year.

The last item is correct. The tower at Wheeler Air Force Base is operated by 14 Army air traffic controllers and was selected for its record of operations and safety.

SP5 Baldwin, assigned to the tower at Yuma's Laguna Army Airfield, said she was motivated by her husband, SP5 Andrew Baldwin.

"If it weren't for Andy, I wouldn't be a controller," she said. "He's a controller and he talked me into it."

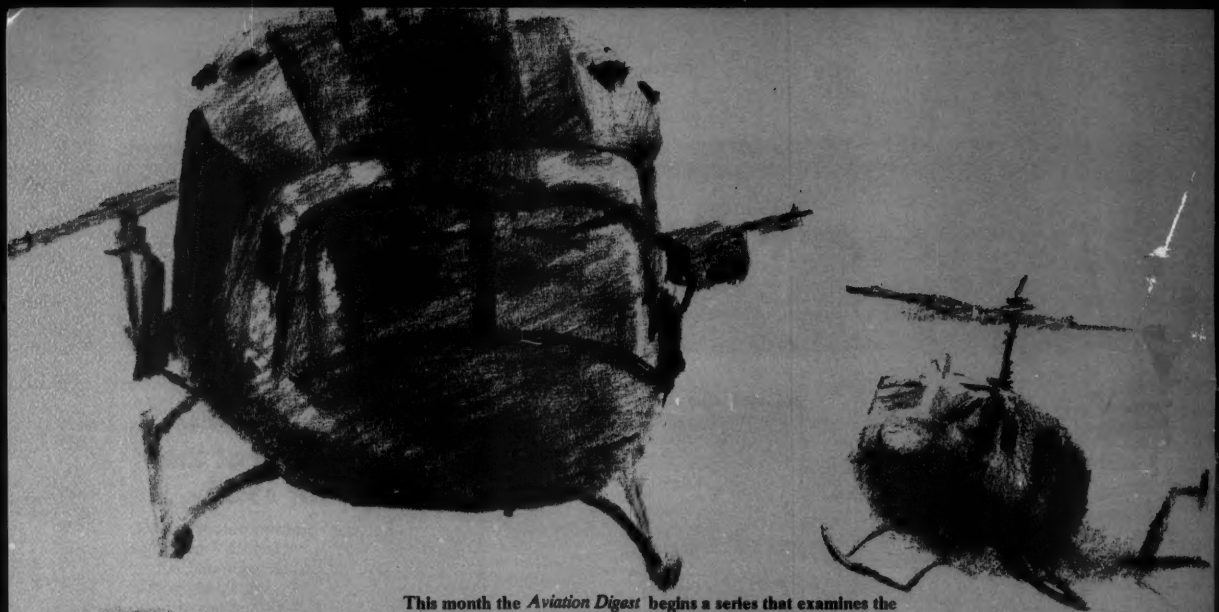
SP5 Baldwin also won Soldier of the Quarter honors for the second quarter of the fiscal year for the Proving Ground and recently earned the first maximum score ever made at Yuma on the E-6 board.

The 6-year Army veteran is continuing her education in her free time.

SP5 Mitchell is assigned to the Ansbach, Germany, Army heliport. Trained in radar maintenance, she was required to maintain both radar and radio equipment during a personnel shortage for 4 months during 1979, the judging year.

She was also chosen to work with a group of installers who were putting in new radio and radar equipment at the heliport to learn as much as possible about the new equipment operation and maintenance.

The selection of the two women Soldiers marked a first for the Army competition. There have been eight controllers of the year selected and two maintenance technicians. All have been men.



This month the *Aviation Digest* begins a series that examines the role of Army Aviation in III Corps, Ft. Hood, TX. Captain Robert Lambert describes how III Corps is employing Army Aviation and Major Odis Lambright and First Lieutenant Tony Warren bring us up to date on Army Aviation in the 2d Armored Division and the 1st Cavalry Division, respectively.

Next month the *Aviation Digest* will feature the 1st Cavalry Division's involvement with joint air attack team exercises ("JAAT Lives") in an article by Majors Thomas Green and Michael Sullivan; also, 2d Armored Division aviation desert operations in First Lieutenant Dave Vogel's article.

The October issue concludes the series with Major Jim Dooley's article on the 16th Air Traffic Control Battalion; Rick Fulton's coverage of the 15th Military Intelligence Aerial Exploitation Battalion; and a feature on Company C, by Specialist Fourth Class Steve Valentine.